Climatological Data for May, 1910.

DISTRICT No. 5, UPPER MISSISSIPPI VALLEY.

GEORGE M. CHAPPEL, District Editor.

TEMPERATURE.

The weather during the month of May was abnormally cool over the whole of the upper Mississippi Valley, and over the northern half of the district it was unusually dry. A cool May in this section of the country is usually accompanied by an excess of precipitation, but during the past month there was a deficiency of moisture, except over southern Iowa, Missouri, most of Illinois, and the small part of Indiana within this district. Also, contrary to the usual conditions for that time of the year, there were no very warm days; the temperature being below the normal nearly every day of the month and at every station in the district. Freezing temperatures were of frequent occurrence over the northern half of the district during the first 14 days, and minimum temperatures, near or below the freezing point, occurred on several days during the latter half of the month over North Dakota, Minnesota, and Wisconsin. The number of days on which the maximum temperature was above 80° was very small in all sections and in no section was the monthly maximum as high as it was in April. In fact the month was characterized by uniformally low temperature, the coldest periods being from the 1st to the 5th and the 11th to the 14th, and the warmest from the 18th to the 20th and the 27th to the 29th.

The mean temperature for the district, as shown by the records of 294 stations, was 54.0°, which is 4.0° below the normal. The highest monthly mean was 63.9° at Cairo, Ill., and the lowest 45.4° at Vudesare, Wis. The highest temperature recorded was 89° at Mount Pleasant, Iowa, on the 21st, and at Sublett, Mo., on the 28th, and the lowest, 10° at Hannah, N. Dak., on the 12th.

PRECIPITATION.

The first half of the month was extremely dry over central and northern Iowa, Wisconsin, Minnesota, and North Dakota, but there were frequent and well-distributed showers during that period over the southern sections of the district. The precipitation during the latter half of the month was general and quite well distributed over all sections, but the monthly amounts were decidedly below the normal, except in southern Iowa, Missouri, Illinois, and Indiana.

In North Dakota there was less than one-half of the normal, but it was fairly well distributed throughout the section and nearly all of it fell between the 14th and 23d, inclusive, but scattered showers occurred on the 1st and the last 4 days of the month. The heaviest precipitation occurred in Walsh and the least in Grand Forks County. There was an average of .01 inch of snowfall.

In Minnesota there was less than one-half of the average for May, and also of May, 1909. The monthly amounts ranged from over 3 inches in eastern Mower, Redwood, and northeastern Roseau counties to less than 1 inch in a number of western and a few central counties. The deficiency of precipitation was general and ranged from less than 1 inch in the extreme northwestern counties to more than 3 inches in Faribault and Houston counties. In the central counties the deficiency was generally over 2 inches. Scarcely any rain fell during the first 14 days of the month, and as a result of the drought, disastrous forest fires prevailed in some of the northeastern counties from early in the month to the 15th, 16th, and 17th, when the drought was broken by nearly general rain.

In Wisconsin there was practically no rain during the first 15 days, but from the 16th to the end of the month frequent and fairly abundant showers occurred at most stations, but the average of the monthly amounts was 1.59 inch below the normal.

In Iowa showers were well distributed throughout the month, but the amounts of rainfall were abnormally light over the northern half of the State during the first 15 days, and were only slightly above the normal over the southern counties. The only portion of the section in which there was a slight monthly excess was the 3 southern tiers of counties.

While North Dakota, Minnesota, Wisconsin, northern Iowa, and northern Illinois were suffering for moisture during the first half of the month, Missouri, central and southern Illinois, and the northwestern part of Indiana were receiving the normal amount or an excess of precipitation. The southern sections of the district received an abundance of moisture during the entire month. The showers were well distributed as to time and locality and in no case was the daily amount extraordinarily heavy, the heaviest being 3.20 inches at La Harpe, Ill., on the 2d.

In Missouri, showers with appreciable amounts of precipitation occurred on 24 days, and more or less general and heavy rains fell on 15 days of the month, the greatest daily amount being 2.32 inches at Steffenville on the 11th.

The greatest daily amount recorded in Indiana was 2.70 inches at Collegeville on the 29th, but amounts in excess of 1 inch were recorded at all stations in the section.

The average rainfall for Illinois was 5.23 inches which is 1 inch above the normal. The greatest monthly amount was 8.65 inches at Morrisonville, and the least 2.32 inches at Dakota. At Cairo, 0.65 inch of rain fell in 35 minutes, between 1:26 a. m. and 2 a. m., and 0.84 inch in 50 minutes between 5:32 a. m. and 6:18 a. m., on the 24th. The average number of rainy days for the State was 12; clear days, 13; partly cloudy, 8; and cloudy, 10.

The average precipitation for the district, as shown by the records of 300 stations, was 3.06 inches, which is 0.72 inch below the normal. The greatest amount, 9.85 inches, occurred at Sublett, Mo., and the least, 0.39 inch, at Beardsley, Wis. A measureable amount of snow fell at 5 stations in the district, the heaviest being 2.0 inches at Crosby, N. Dak. All the snow reported was from North Dakota, Minnesota, and Wisconsin, with a trace at 1 station in Illinois.

SUNSHINE AND CLOUDINESS.

The average number of clear days was 14; partly cloudy, 8; and cloudy, 9. The duration of sunshine was very nearly the normal, being slightly below in southern and slightly above in the northern sections.

WIND.

Northwest winds prevailed. The highest velocity reported was 46 miles per hour, from the west, at Devils Lake, N. Dak., on the 28th.

MISCELLANEOUS.

On account of the extremely dry weather over Minnesota and Wisconsin during the first half of the month, extensive forest fires occurred in the northern part of those States.

Mr. U. G. Purssell, Section Director at Minneapolis, Minn., reports:

> Scarcely any rain fell during the first 14 days of the month, and as a result of the drought, disastrous fires forest prevailed in some of the northeastern counties from early in the month to the 15th, 16th, and 17th, when the drought was broken by nearly general rain which quenched the fires. Vast tracts of standing timber were destroyed, as were also a large number of logs, poles, and ties.

Heavy frosts, and over the northern sections freezing temperatures during the early part of the month, did little or no damage as practically all the fruit and tender vegetation had been killed by frosts and freezing temperatures during the month

of April, but the continued cold weather prevented the germination of corn and the normal growth of all farm crops and other forms of vegetation. Much more than the usual amount of corn was replanted and still the stand is below the average. The poor stand is, however, largely due to the fact that nearly all of the seed corn was injured by the severe freezing weather which passed over this district on the 12th and 13th of October last.

Continued cool weather also favored the propagation of cut and wire worms, and these insects are doing much more than the usual amount of injury to the young corn plants. The foliage of shade and fruit trees was about as far advanced at the close of the month over the central portions of the district as it was before the freeze, April 15.

The droughty conditions which prevailed over a large part of the district during the first half of the month reduced the prospects of an average hay crop. Grass in meadows and pastures is short from Iowa northward to the Canadian border.

The number of thunderstorms and wind squalls was less than usual during May.

The only severe storm within the district occurred at Cairo, Ill., on the evening of the 22d. Mr. W. E. Barron, Local Forecaster, reports regarding the storm as follows:

A thunderstorm occurred in the afternoon and early evening of the 22d that developed into a severe local storm in the western portion of the city of Cairo, with some of the characteristics of a tornado. One cottage was overturned, 5 others were shifted from their foundations and 1 lost its roof, besides minor damage to buildings, sheds, and trees. No lives were lost. From the time of the first thunder at 2:53 p. m., there had been low rumblings to the south and southwest. Light rain fell at intervals beginning at 1:11 p. m. From 6:15 p. m. to 6:20 p. m., there was a sharp downpour, accompanied by sharp lightning and thunder. The clouds at the p. m. observation were recorded as 10 nimbus, direction east, but before the observer descended from the roof a peculiarly threatening cloud with jagged edges was approaching from the southeast, with a green color underneath and apparently behind it. The wind shifted at 6:46 p. m. from the northeast, velocity 13 miles, to southeast and reached a maximum of 31 miles per hour at 6:52 p. m. There was considerable sharp lightning and thunder. A clock in a house that was overturned stopped at 6:55 p. m. The last thunder was heard about 7:15 p. m., but the rain continued until about 8:10 p. m., though not at a heavy rate; the total amount to that time being 0.44 inch. The barometer had fallen steadily since 8 a. m., and fluctuated slightly from 6:45 p. m. to 8 p. m., but did not reach its lowest point until about 10:30 p. m., though the recorded height, 29.61, reduced to sea level, was the lowest reading for the month. The temperature dropped from 70° to 64° within a very few minutes after the evening reading had been made.

The first evidence of a hard wind was shown at the corner of Twenty-fourth street and Commercial avenue, where a telegraph pole was broken off near the ground. From this point the path of the storm was irregularly west-northwestward to the Mississippi River. While most of the débris was displaced in line with the apparent path of the storm, there are several places where a movement toward it was shown.

The first serious damage was to a dwelling house at 3005 Elm street—the southeast front end of which was moved 8 inches to the northwest, breaking the 4-inch brick foundation wall on both sides. About 100 feet west a large cottonwood tree was torn up, partly by the roots and partly broken across the 2½-foot butt, which was carried about 8 feet from its original place; the direction taken was toward the southwest. A number of buildings were passed over in the next 4 blocks of its path, and the damage there was slight. Peculiar wind movements were noted at 3108 Washington avenue, where small articles were carried from the northeast and southwest sides of the house, then back toward it. At 3115 Washington avenue, the north corner post of a front porch was taken out and the boardwalk leading from the house to the street was picked up and carried some distance west.

The house that was overturned was located at 720 Thirty-fifth street. The front southeast end was carried about 35 feet to the southwest, the rear a shorter distance. It rests on one side of the roof, while the other side is opened out on the ground like the cover of a book. Not one of the seven people in the house at the time was much injured. Just beyond this, the house at 725 Thirty-sixth street was moved from its foundations, the rear, southeast end being carried 20 feet to the southwest; the other end but 2 feet. The front, northwest end of a cottage separated from this one by 2 20-foot lots was shifted a few inches to the northeast, while a large locust tree in the street immediately in front of it was blown directly west. Across Thirty-sixth street, at No. 728, a front porch roof was lifted and let down again on the posts, which were somewhat displaced. The next house, No. 732 Thirty-sixth street, was not only shifted from the brick piers on which it rested, but the roof was torn off and the pieces scattered to the west, some of them fully 800 and 1,000 feet over the Cairo and Thebes Railroad embankment—New levee—to near the Mississippi levee. The next house in line was a light frame structure about 300 feet farther west and across the tracks of the Big Four Railway. It was moved about 8 feet toward the south. Trees near the corner of Thirty-seventh street and the Big Four Railway were also moved toward the south. All of the houses moved by the storm were 1-story frame cottages, resting on nothing heavier than brick piers or 4-inch brick foundations. A large shed used as a workshop, near the corner of Thirty-eighth street and Highland avenue, was blown flat toward the south.

The crew of the steamer *Barrett* reported that the water in the Mississippi River was whirled into the air a short distance ahead of them as they came down stream. No report of the further progress of the storm has been received.

The clouds are described differently by various witnesses, depending on their view points. Mr. D. K. Brown, living at the corner of Thirty-third street and Highland avenue, describes the cloud as coming from the southeast, hanging low, the edges as jagged like the teeth of a saw. Mr. J. W. Williams saw the storm from his residence, 628 Thirty-fourth street, so marked, and stated that a second cloud from the north or northeast met the cloud above described almost due east of his position, apparently over the Ohio River, about three-fourths mile distant. After the 2 clouds came together there was a whirling and a bounding motion; leaves, etc., were carried up; but he noticed no funnel-shaped cloud. He said the motion of the whirl was opposite the hands of a watch. His statement of the 2 clouds meeting is corroborated by other witnesses. Mr. William Booth, of 3409 Washington avenue, watched the storm from the second floor of a building at the corner of Thirtieth and Sycamore streets, which he said was shaken by the wind. He states that the 2 clouds came together and formed a funnel near the first house that was seriously damaged, southwest of his position. The funnel was black and there was a light pink glow above it. After lowering the trees near the corner of Thirty-first and Elm streets, it bounded up and seemed to roll like the wheel of a wagon in a westerly direction, then dropped down again somewhere beyond Thirty-fourth street. He observed no lightning from the funnel cloud and there was no hail Another witness living at 708 Thirty-sixth street, about 250 feet to the right of the storm's path, also noticed the whirling funnel-shaped cloud and states that it did not touch the ground until it reached Thirty-sixth street; all kinds of leaves, trash, etc., were carried up by it. One witness compares the noise of the storm to the sound of bees swarming, another to the roar of a heavily loaded train, while a third said it seemed to him only the sound of the swaying of trees.

The point where the funnel cloud is described as forming is about 4,500 feet west-northwest of the Weather Bureau station, and the distance from that point to the Mississippi River is about 3,500 feet. Out of this, the track of material damage is about 700 feet. At Thirty-sixth street its width appears to have been 75 feet.

STAGE OF RIVERS.

The stages of the rivers were below the normal in the northern section of the district, but in the southern section many of the streams were up to the flood stage at some time during the month.

Wisconsin.—The rivers throughout this section were low, although the general rains during the last 15 days raised them somewhat.—*H. B. Hersey, Inspector.*

Illinois.—The Illinois River was above the flood stage at La Salle from the 2d to the 13th and the 26th to the 31st. It was above the flood stage at Peoria nearly all the month. At La Salle the highest stage was 21.0 feet on the 4th, and at Peoria, 15.6 feet on the 8th. At Beardstown the river was constantly above the flood stage from the 10th to the close of the month. Farm operations were delayed on some of the bottom lands of the Illinois River. At Chester the maximum stage of the Mississippi River was 22.2 feet on the 11th and the lowest, 9.4 feet, on the 2d.—*William G. Burns, Section Director.*

Dubuque, Iowa.—The rivers were low for May throughout the district. The Mississippi at Prairie Du Chein was below a 4-foot stage from the 15th to the 25th, inclusive, while at Dubuque it reached a 4-foot stage on the 20th and 21st, or the lowest during May in 8 years. It has been lower at Dubuque only 4 times during May in 37 years. The Wisconsin was under a 3-foot stage during most of the month at Grand Rapids and Muscoda. General rains during the last 10 days of the month slightly raised the Mississippi.—*J. H. Spencer, Local Forecaster.*

Keokuk, Iowa.—Notwithstanding the abundant rains, the Mississippi River is much below the average stage for the season.—*Fred Z. Gosewisch, Observer.*

The stage of Des Moines River at Des Moines ranged from 2.1 feet on the 8th to 2.9 feet on the 24th and 25th, falling again to 2.5 feet by the end of the month. This is much below the May normal.

The Maquoketa River, Iowa, was above the flood stage for a short time on the night of the 21st-22d, due to a severe local storm in the western part of Dubuque and eastern Delaware counties. The Dyersville Commercial of May 27 says:

The rainstorm came up from the northwest shortly after 7 o'clock, and from a drizzling shower, developed into a veritable cloudburst, the water coming down in torrents, continuing for several hours. The Maquoketa gradually assumed a flooded condition and overflowed its banks. The river continued to rise until about 2 o'clock Sunday morning. Much damage was done to county bridges and culverts, many of the latter being entirely washed out. The south abutment of the Black Bridge in North Dyersville was badly undermined and may have to be rebuilt. The washing out of a portion of the approach necessitated temporary repairs before it was passable. The bridge that spans Bear Creek south of town was also slightly undermined. There are also numerous bridges in other localities that are in bad shape. Reports are to the effect that the vicinity of Richardsville suffered the most damage, and that the rain there was the most severe. Fences were washed out and fields so badly washed that replanting will be necessary in many instances.

DRAINAGE AND ENGINEERING NOTES.

During the month of May the United States Army Engineers, who are surveying the Des Moines River under the supervision of Mr. A. O. Rouse, completed the transit and level lines for base of survey, and also made topographic survey on both sides of the river covering the area subject to overflow. Soundings and probings of the river bottom and levels to determine water slope were also taken for 8 miles below Des Moines.

Mr. H. A. Kipp, Engineer, Drainage Investigations of the United States Department of Agriculture, in charge of a party of engineers, began work in southern Iowa during the month. A survey will be made of a river basin in that part of the State and plans will be made for its drainage.

The following interview with Mr. C. G. Elliott, Chief of Drainage Investigations of the United States Department of Agriculture, was recently published in the Des Moines Register and Leader:

In my department we simply make surveys and then recommend improvements. In Iowa, the drainage problem is taken care of by established districts. Each district works independently of the others and the cost of the drainage improvement is taxed to those who are benefited. Oftentimes the work is not done as it should be, or the drainage operations of 2 districts conflict with each other. In some cases the rivers are not deep enough to carry away the water, causing overflows. We find many other conditions that might be improved. It is the purpose of the drainage investigating commission to aid the farmers as much as possible and to give suggestions as to the best methods of draining the land.

Iowa has done more drainage work during the past year than any other State in the Union. The farmers are also showing the best judgment in their methods of draining. It is much more economical in the long run to use large tile under the surface than to adopt the less expensive method of open ditches. Ditches take up a large amount of good land and considerable expense is involved in cleaning them out, and they are also very inconvenient to the farmer working in the field. The Department of Agriculture does everything in its power to get the farmer to see the advantages of tile draining.

In our investigations in Iowa we will not be able to survey the State thoroughly. Three or four typical river valleys will be covered and reports made accordingly. We will make our recommendations to the members of the state commission. They, in turn, will report to the legislature, and that body will make suitable changes in the drainage laws.

Prof. W. H. Stevenson, Ames, Iowa, secretary of the Iowa State Drainage Association, has issued the report of the 1910 annual meeting of the association in a pamphlet of over 100 pages. The report contains many papers, addresses, and discussions of value to those interested in the drainage of farm lands. Professor Marston's address on "Tile Drainage Engineering" gives much valuable information to land owners and drainage engineers. The following subjects were also covered at the meeting by addresses and discussions: Uniformity of Contracts and Specifications for Drainage Work, Data to be contained in a Parliamentary Drainage Report, Surface Water Inlet into Ditches, Public Drainage in Iowa, Its Hindrances and Needs, and many others which are just as interesting and valuable.

THE RECLAMATION OF MINNESOTA'S WASTE LANDS.

By GEORGE A. RALPH, State Drainage Engineer.

Minnesota's greatest resource, her greatest heritage, is her vast wealth of productive soil. The forest wealth of the State is growing less from year to year; her vast deposits of iron ore will in time become exhausted, but the producing power of her fertile soil will, with proper husbandry, last for all time.

Minnesota is situated in the geographic center of North America. Her surface lies in three great continental watersheds. The waters from about two-thirds of the State flow southward through the Mississippi and into the Gulf of Mexico. The northeastern portion of the State drains eastward into Lake Superior and through the Great Lakes to the Gulf of St. Lawrence. The north and northwestern parts of the State drain into Red River of the North and Rainy River and flow northward, emptying in Hudson Bay.

The altitude of the State ranges from about 700 to 1,600 feet above the sea, the average altitude being about 1,200 feet. Her surface is of a generally rolling character, with some large stretches of level meadow and marsh land.

The State is well supplied with natural water courses, and surface slopes are generally very favorable for cheap and effective drainage.

The following statement gives the fall in feet of the most important streams of the State:

	Feet.
Mississippi River, from source to southern boundary of Minnesota	858
St. Louis River, from source to Lake Superior	1,000
Rainy River, source to Lake of the Woods	540
Red River, source to Canadian boundary	750
Minnesota River, source to Mississippi	300
St. Croix River, source to Mississippi	300

A surface slope of 6, 8, and even 10 feet to the mile is not uncommon on wet land areas. In its natural condition more than one-fifth of the State was too wet for agricultural purposes. These wet land areas are fast disappearing—millions of dollars have been expended in the construction of drainage ditches and in the improvement of streams.

The greatest system of storage reservoirs to be found in the American Continent has been constructed at the headwaters of the Mississippi River. The reservoirs were created for the purpose of controlling flood waters and regulating the flow of the Mississippi River.

Minnesota has more than 7,000 meandered lakes. More than can be found in any other 10 States of the Union; nearly 4,000,000 of her total area of 53,900,000 acres are lake surface. In natural scenery the State is surpassed by few of the States of the Union— Minnehaha Falls, St. Anthony Falls, Minneopa Falls, The Dalles of St. Croix, Granite Falls, Zumbro Falls, Redwood Falls, Koochiching Falls, and the Falls of the St. Louis River are all famous for their magnificence and grandeur, and annually attract thousands of tourists.

Minnesota, though generally known as a prairie State, contained in its original state extensive forests of very valuable timber, and for more than 50 years the manufacture of lumber has been one of her principal industries. There are 31 different kinds of woods in her forests from which lumber is manufactured, including the finest quality white pine, oak, black walnut, cherry, ash, birch, butternut, spruce, and red cedar.

Minnesota's water resources are among her greatest natural assets; water powers amounting to 250,000 horsepower have already been developed on her streams, and when the available water power of the State has been developed to its fullest extent it will reach at least 500,000 horsepower.

The average annual rainfall of the State for several years has been approximately 27.8 inches, the range being from 24 to 33 inches. The greater portion of this rainfall comes in the summer months, just when it is needed for growing crops. The average precipitation for June is from 5 to 6 inches, while the average for December, January, and February is about 1 inch each.

A very large proportion of the land area of Minnesota contains very fertile soil. The famous Red River Valley, which extends some 200 miles along the western boundary of the State, and is from 20 to 30 miles wide along the Minnesota side of the river, has a wonderfully productive soil. The Minnesota Valley is equally productive. Analysis and soil tests made by the Department of Agriculture, Washington, D. C., place Minnesota soils in the first rank. A statement showing the comparative value of samples of the best soils selected from 45 different localities, covering nearly every State in the Union, gives Minnesota soils a higher percentage of plant food than those of any other locality.

Minnesota in her natural condition had large areas of wet lands, nearly one-fifth of her total area being too wet for agricultural purposes, but a wonderful transformation of her land surface has been brought about during the past 15 years. Millions of acres of wet land have been reclaimed by the construction of drainage ditches; as a result, the swamp land area of the State is diminishing at the present time at the rate of nearly a million acres annually. One large drainage project in the northwestern part of the State, now being worked out, will reclaim 400,000 acres; another 150,000, and a third, in the northeastern part of the State, nearly 100,000 acres. In fact, drainage work is being carried on wherever wet land is found. This reclaimed land is the most productive of the State, and in time will command the highest prices.

There are, at the present time, about 2,000,000 acres of government land in this State subject to entry under the land laws of the United States, nearly 100,000 acres of which is contained in the area to be drained by the big drainage project in eastern Marshall County.

The State owns about 3,000,000 acres of school and swamp land and offers for sale annually from 100,000 to 250,000 acres. These lands are sold at public auction, the minimum price being $5 per acre. A payment of 15 per cent of the purchase price is required at the time of purchase. The balance may run for 40 years at 4 per cent interest.

The transportation facilities of Minnesota give her a great advantage. Four great transcontinental lines of railway cross the State; the total number of miles of railway within the State being a little over 8,000. Lake Superior extends nearly one-third of the distance across the State, and in volume of tonnage the harbor of Duluth is the greatest in the world.

Minnesota's iron mines are another of the State's great natural resources. These mines, though they have only been in operation for a few years, are proving to be very rich and of great magnitude. There are 3 different ranges from which ore is now being mined—the Vermillion, the Mesabi, and the Cayuna. The extent of these ore beds has not been definitely determined; sufficient is known, however, of their greatness to warrant the statement that upward of 1,500,000,000 tons of high grade iron ore is contained in the iron mines of Minnesota. The output for the past year was nearly 30,000,000 tons.

The great areas of swamp and marsh land of the State are fast becoming the great wealth producing areas.

Statistics of drainage work carried on under county management in the several counties of the State show that approximately 7,000 miles of drainage ditches have been constructed in the several counties through this channel. These ditches drain and reclaim about 4,000,000 acres of wet land, and $8,850,000 has been expended carrying out the work. Polk County alone has constructed 592 miles of ditches, which drain 972,341 acres at a cost of $755,760.12. Marshall County will, when her big Mud Lake drainage project is completed, have 797.75 miles of ditches, which will reclaim 771,436.33 acres at a cost of $993,246.43. Clay County has constructed 189 miles of ditches at a cost of $320,708, and drained 261,717 acres of wet land; Wilkin County, 188 miles which drain 196,183.6 acres at a cost of $263,290.36; Brown County, 227.2 miles of ditches which drain 18,572 acres and cost $274,756.62, the greater portion of the Brown County ditches being tile drains.

Every county in the State, with the exception of Cass, Fillmore, Houston, Rock, Pipestone, Mower, St. Louis, Koochiching, Lake, and Cook, is engaged in reclaiming its wet land areas.

Besides the work carried on under county management, a very large amount of drainage work is now being done by the State Drainage Commission. Up to the present time, and including the work under way, there have been constructed under this management 1,069 miles of drainage ditches, which have reclaimed about 1,079,700 acres of land at a total cost of $1,324,800.

The total amount expended in the construction of public ditches in the State of Minnesota, through all channels, is, therefore, $10,174,800. The total number of miles being 8,069, the total area reclaimed is approximately 5,079,700 acres.

As a result of the extensive drainage work thus being carried on, drainage contractors from all parts of the United States have been attracted to Minnesota to bid on ditch work, and notwithstanding the fact that prices for labor and commodities of all kinds have been steadily advancing during the past 10 years, the price paid for drainage work has kept steadily going down; the work was let last season for 5.7 cents per cubic yard, the lowest price ever reached in any western State.

The work carried on by the State Drainage Commission has been not only an incentive for county work, but has also acted as the regulator or balance wheel on cost of doing the work. The work carried on by the State has always been conducted more economically than under county management.

The contracts for State work have been let at uniformly low figures, and wherever the State has cooperated with the county authorities in letting ditches, very low prices have been secured. Nicollet County cooperative ditch was let for 6.7 cents per yard. Twelve cents per yard was the prevailing price for ditch work in this county prior to this time. The big Steele County ditch was estimated by the county authorities to cost $72,000. By cooperating with the State Drainage Commission the work was let for 5.9 cents per yard, or a total of $36,000. Kandiyohi County, by cooperating with the State Drainage Commission, let a contract for Judicial Ditch No. 1 for 6.2 cents per cubic yard. Had this work been let at the prices that prevailed for county work it would have cost the taxpayers $36,000 more than it did.

Great improvements have been made during the past 10 years in ditching machinery. Ditching machines designed to dig any kind of a ditch can now be procured—machines that will excavate ordinary ditches at a cost of from 2.5 to 4 cents per cubic yard.

The great activity in drainage work all over the State is in a large measure attributable to the State's excellent drainage laws, which are both equitable and practical. It would be hard to prepare a drainage law that would be more applicable to the various conditions met with in carrying out drainage work throughout the State and which would give more satisfactory results than our judicial ditch law. It is the result of much hard work on the part of some of the best lawyers, most practical business men, and best drainage engineers of the State.

The law under which the Drainage Commission constructs ditches is a very practical one. In the construction of 50 state ditches under this law there is but one instance where an appeal has been taken. This case is now pending and will probably be settled to the satisfaction of all concerned without a trial court.

The Federal drainage law, known as the Volstead Act, authorizes the taxing of all wet lands owned or controlled by the Federal Government for the construction of drainage ditches. This, I am informed, is the first law enacted by Congress authorizing the asssessment of special taxes against government lands. It is the first instance where the Federal Government has made provisions for the payment of the cost of constructing drainage ditches. Under the terms of the Volstead Act the citizens of the counties of the State in which government lands are situated may proceed to drain these lands, tax the cost of doing the work up to all lands benefited in proportion to the benefits received, and when the taxes become due they are authorized to place these lands on the market, sell them, and reimburse the county out of the proceeds of the sale, the only condition being that the Government shall be paid $1.25 per acre, and that the purchaser shall be a qualified entryman under the land laws of the United States. Estimating the cost of drainage at $2 per acre, the amount to be realized when lands are offered for sale, in order to make the county and government whole, would be $3.25 per acre. The poorest lands in northern Minnesota, when properly drained, should sell readily at from $8 to $10 per acre.

With the excellent drainage laws now on our statute books the people of northern Minnesota can reclaim and place on the market all lands that will be benefited by drainage. A petition signed by one or more interested landholders starts the machinery in motion for a drainage system costing thousands of dollars, and if the proposed ditch will be of greater benefit than the cost of construction, will be of public utility and promote the public health, it is mandatory upon the court to order the ditch.

A very important feature of the drainage work now being done by the State Drainage Commission and much of the work done under the county management is the public highways constructed in connection therewith. Nearly every mile of ditch has a graded road along the bank thereof. The contracts for 464 miles of State ditches now under construction by the State Drainage Commission, include 367 miles of good roads which will be constructed along the banks thereof. These roads will be the very best roads of the country and will render all lands drained easily accessible. These roads are built from the dirt excavated from the ditch. The average cost per mile for levelling off the dirt and making it suitable for a highway is about $75.

The big Mud Lake drainage project now under construction by Marshall County will include over 400 miles of graded roads along the banks of the ditch.

Northern Minnesota counties have it within their power to lay out and construct ditches and highways across their swamp land areas and a very large proportion of the cost of doing the same can be taxed up to the government and state lands. The people of southern Minnesota fully appreciate the great benefits to be derived from proper drainage and are not only putting in open ditches for outlet drains wherever necessary, but a large amount of tile drainage work has been carried on all over southern Minnesota. Tile factories in different parts of the State are taxed to their utmost capacity to supply the demand for tile. As a result of this drainage work, farm land values are steadily going up, and in a very short time a good farm in southern Minnesota will command as high a price as the best Illinois farms.

What is accomplished by drainage in southern Minnesota can be accomplished in northern Minnesota. Prof. Thomas Shaw, one of the most eminent agriculturists in America, says that northern Minnesota possesses advantages as a stock-raising country unequaled elsewhere in the world. In the summer of 1906 I collected samples of the swamp soil from different localities in the northern part of the State and had the same analyzed by the Department of Agriculture, Washington, D. C., The results of these analyses showed a quick, responsive soil with a high content of all elements necessary for successful plant growth.

State Ditches 69, 72, and 91 in Roseau County, which are now being constructed, will be completed during the season of 1910. These ditches will make suitable for cultivation 140,000 acres of rich prairie and meadow land.

State Ditches 88 and 89, and Judicial Ditch No. 1, Itasca, Aitkin, and St. Louis counties will be completed this season. These ditches drain approximately 60,000 acres of rich swamp and marsh land, which can be easily cultivated and made suitable for growing crops.

The State Legislature, at its last session, authorized the State Drainage Commission to make surveys of the water resources of the State. The Drainage Commission, in cooperation with the United States Geological Survey, is now making surveys and stream measurements of all the important streams of the State. These surveys, when completed, will not only show the available water power of the State, but will also show all feasible sites for storage reservoirs. A report covering the work will be submitted to the next state legislature.

The results obtained from these surveys up to the present time would indicate that it is entirely feasible to construct storage reservoirs on some of the most important streams of the State, in addition to those already constructed, and that sufficient water can be stored therein to not only prevent in a large measure damages from floods, but serve to equalize the flow of the streams of the State, so as to largely increase the value of all water powers now developed or which may hereafter be developed.

The State Drainage Commission was also authorized by the legislature to make topographic surveys of the various watersheds of the State for the purpose of securing data from which proper drainage plans might be prepared, and when these surveys are completed, to prepare and file with the county auditors of the State complete drainage plans for the several counties, such plans to be adopted by the county in all future drainage work. Topographic surveys are now being made by the State Drainage Commission, in cooperation with the United States Geological Survey, Washington, D. C. These surveys, owing to the very thorough manner in which they are executed, will require several years time to cover the State. It is expected that surveys covering about 6 counties will be completed by the close of the year 1910. Topographic surveys covering nearly all the northern part of the State, and considerable territory around the Twin Cities, have already been made. Reports of these surveys will be ready for distribution from time to time as the work progresses. Reports of the Water Resources survey will be ready for distribution, in a limited number, after January 1, 1911. One-half of the cost of these surveys is borne by the Federal Government.

RELATION OF DEFORESTATION TO PRECIPITATION AND RUN-OFF IN WISCONSIN.[1]

By WILLIAM C. DEVEREAUX, Local Forecaster, Milwaukee, Wis. Dated June 3, 1910.

INTRODUCTION.

The great importance of the natural resources of Wisconsin is beginning to be fully appreciated, and the problem of the conservation of those resources is receiving much attention by the State authorities. In the early days most of the surface was covered with a magnificent forest which yielded a large revenue, and there is still a considerable amount of timber, especially in the northern section. The rivers have sufficient fall, and, at present, sufficient water to furnish a great amount of power for manufacturing and other industries. Millions of dollars have already been spent in developing the water power, and much more will be spent in the future for the same purpose. It is of

[1] Printed by order of the Chief of Bureau.

TABLE 1.—*Climatological data for May, 1910. District No. 5, Upper Mississippi Valley.*

Stations.	Counties.	Elevation, feet.	Length of record, yrs.	Temperature, in degrees Fahrenheit.							Precipitation, in inches.				Number of rainy days, .01 inch or more.	Sky.			Prevailing wind direction.	Observers.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall unmelted.		Number of clear days.	Number of partly cloudy days.	Number of cloudy days.		
North Dakota.																				
Amenia	Cass	954	12	51.0	− 3.6	78	27†	21	12	46	0.80	− 1.93	0.70	0.0	2	14	10	7	nw.	C. E. Wood.
Bottineau	Bottineau	1,638	14	48.6	− 3.1	84	27	20	12	46	1.70	− 0.47	0.48	0.0	9	15	5	11	se.	J. A. Kemp.
Cando	Towner	1,488	8	48.2	− 2.4	84	27	12	12	53	0.92	− 1.12	0.30	0.0	4				s.	E. T. Judd.
Crosby	Williams		3	49.5		79	27	21	1	39	2.21		0.63	2.0	8	15	10	6	nw.	H. C. Kaschau.
Devils Lake	Ramsey	1,482	4	49.0	− 3.7	81	27	21	12	40	0.91	− 1.09	0.33	0.0	9	11	13	7	nw.	U. S. Weather Bureau.
Donnybrook	Ward	1,760	10	51.1	+ 2.9	84	27	27	25	47	1.66	− 1.00	0.75	0.0	7					C. J. De Vore.
Dunseith	Rolette		12	49.3	− 3.8	81	27	20	12	44	1.56	− 0.07	0.65	0.0	4	22	4	5	w.	L. H. Trowbridge.
Edmore	Ramsey	1,524	4	51.4[a]		83[a]	14	15[a]	12	47[a]	1.20		0.50	0.0	5				n.	H. R. Aslakson.
Forman	Sargent	1,249	15	55.4	− 0.1	83	14†	26	2	46	0.64	− 2.03	0.36	0.0	3	10	13	8	nw.	A. Maltby.
Grafton	Walsh	837	12																	H. La Moure.
Granville	McHenry	1,504	3	50.0		85	27	24	12	45	0.81		0.32	0.0	6	9	21	1	nw.	W. A. Christiansen.
Hannah	Cavalier	1,568	4	45.8[a]		75[a]	27	10[a]	12	45[a]	0.79		0.41	0.4	7					J. Moffatt.
Hansboro	Towner		2	47.2		84	27	19	12	45	1.39		0.45	T.	10	19	4	8	nw.	Geo. Dale.
Hillsboro	Traill	901	4	51.1		79	14	24	12	39	0.89		0.36	0.0	4	15	11	5	n.	M. H. Norman.
Lakota	Nelson	1,519	3	48.2		79	27	18	11	45	1.26		0.41	0.0	10	7	21	3	nw.	C. R. Pettes.
Langdon	Cavalier	1,615	14	46.8		81	28	15	12	45	0.75		0.33	0.6	6	17	0	14	w.	J. Woolner.
Larimore	Grand Forks	1,134	14	49.4	− 2.9	81	14†	22	12	41	1.21	− 0.83	0.34	0.0	7	15	5	11	n.	S. R. Britton.
Lisbon	Ransom	1,091	5	50.9		81	14	20	2†	48	1.18		0.53	0.0	6	17	7	7	nw.	H. K. Adams.
McKinney	Ward	1,640	15	49.8	− 2.6	85	27	19	2	45	1.10	− 0.80	0.85	0.0	2	17	7	7	nw.	N. P. Swenson.
Manfred	Wells	1,605	8	50.5		84	27	21	12	52	0.84		0.28	0.0	6	6	20	5	nw.	P. B. Anderson.
Mayville	Traill	975	14	54.6	− 0.4	73	27	35	1	15	0.69	− 1.96	0.34	0.0	4	10	21	0	nw.	M. N. Pope
Minot	Ward	1,557	11	52.4	− 0.8	84	27	28	2	49	1.13	− 1.33	0.58	0.0	8	22	0	9	nw.	J. J. Bates.
Minto	Walsh	820	16	50.0	− 3.6	81	27	20	12	46	2.20	+ 0.13	0.77	0.0	10	15	9	7	n.	S. S. Marsh.
Oriska	Barnes	1,270	4	51.3		81	14	23	12	42	0.56		0.22	0.8	6	5	24	2	nw.	W. E. Williams.
Park River	Walsh	998	6	49.8[a]		83[a]	27	21[a]	12	39[a]	0.74		0.33	T.	7	16	13	2	n.	A. Heyward.
Pembina	Pembina	789	11	48.1	− 4.6	79	30	20	12	44	1.46	− 0.60	0.22	0.5	9	18	3	10	e.	C. W. Shumaker.
Portal	Ward	1,954	15																	M. S. Davis.
Power	Richland	1,020	17	48.9	− 5.9	82	14	18	2	51	0.59	− 1.81	0.31	T.	2	12	13	6	nw.	J. A. Power.
Pratt	McHenry		5	49.6		85	26	13	12	42	0.98		0.45	0.0	5	15	8	8	nw.	C. H. Butts.
University	Grand Forks	830	18	50.0[a]	− 3.7	87[a]	27	21	12†	44[a]	0.50	− 2.04	0.28	0.0	5	14	8	9	n.	W. R. Holgate.
Wahpeton	Richland	962	18	48.8	− 7.7	80	18	21	13	44	0.57	− 2.44	0.46	0.0	2	16	5	10	nw.	E. G. Burch.
Walhalla	Pembina	966	5																	C. H. Lee.
Westhope	Bottineau		3	49.8		86	27	17	20	51	1.39		0.90	0.0	6	17	1	13	nw.	J. D. Currie.
Willow City	....do	1,471	16	48.2	− 4.0	85	27	10	16	49	0.89	− 1.08	0.33	0.0	5	4	23	4	nw.	M. A. Ostby.
Minnesota.																				
Albert Lea	Freeborn	1,229	20	54.8	− 3.0	82	8	29	3	43	2.50	− 1.83	0.85	0.0	7	13	11	7	nw.	Edward Carey.
Alexandria	Douglas	1,391	16	52.8	− 1.0	81	19†	28	3	40	1.07	− 1.24	0.45	0.0	4	20	2	9	nw.	P. O. Unumb.
Angus	Polk	870	8	49.4		78	27	20	13	44	0.71		0.22	0.0	5	13	9	9	n.	John Nadvornik.
Bagley	Clearwater		4	48.2		75	14	18	2	43	1.31		0.42	T.	8	9	17	5	nw.	Jens Nelson.
Baudette	Beltrami	1,084	1	49.1		76	27	21	3	41	1.26		0.48	0.2	8	20	5	6	sw.	Franz W. Schmidt.
Beardsley	Big Stone	1,090	17	51.6[b]	− 5.1	84[b]	18	24[b]	3†	45[b]	0.39		0.22	0.0	4[b]	7[b]	16[b]	6[b]	nw.	Roy A. Smith.
Beaulieu	Mahnomen	1,200	8	50.8		77	14†	24	2†	41	1.41		0.45	T.	7	6	16	9	n.	Dr. L. A. Parkinson.
Bird Island	Renville	1,039	20	53.4	− 3.2	79	18†	27	3	42	1.54	− 1.69	1.07	0.0	5	16	5	10	nw.	Dr. F. L. Puffer.
Caledonia	Houston	1,179	17	53.6	− 3.7	76	20	31	3	31	1.87	− 3.28	1.20	0.0	4	16	2	13	nw.	W. D. Belden.
Campbell	Wilkin	984		51.0		83	19	20	2	45	0.52		0.20	0.0	4	17	4	10	nw.	J. T. Neiseas.
Cass Lake	Cass	1,300	4								1.30		0.65	0.0	3					C. W. Burns.
Collegeville	Stearns	1,282	17	54.2	− 2.0	79	18†	32	2†	32	1.39	− 1.59	0.69	0.0	6	19	8	4	nw.	Fridolin Tembreul.
Crookston	Polk	863	20	50.0	− 3.5	79	28	25	12	35	0.66	− 2.33	0.19	0.0	7	20	3	8	n.	A. G. Andersen.
Detroit	Becker	1,364	14	49.6	− 3.1	78	15†	19	2	42	1.11	− 2.79	0.32	0.0	7	20	6	5	nw.	George W. Peoples.
Fairmont (near)	Martin	1,240	23	52.2	− 4.4	75	18	27	3	34	2.25	− 2.03	0.75	0.0	7	15	9	7	nw.	W. F. Wherland.
Faribault	Rice	1,003	13	52.3	− 4.9	78	18	22	3	39	1.62	− 1.90	0.61	0.0	8	16	10	5	nw.	Dr. A. R. T. Wylie.
Farmington	Dakota	902	22	54.8	− 1.4	81	19	24	4	43	1.54	− 2.05	1.07	0.0	3	18	2	11	nw.	D. F. Akin.
Fergus Falls	Ottertail	1,210	18	52.9	− 2.3	78	18	28	12	35	0.63	− 2.67	0.36	0.0	6	17	11	3	nw.	Chas. E. Kissenger.
Fort Ripley	Crow Wing	1,136	4	51.8		83	19	21	3	51	0.95		0.95	6.0	1	16	2	13	nw.	J. J. Tucker.
Fosston	Polk	1,289	1	47.6		73	14†	22	13	50	0.37		0.25	0.0	9	12	16	3	s.	O. N. Hem.
Glencoe	McLeod	1,000	14	54.6	− 0.5	79	18	28	3	37	2.15	− 1.93	1.45	0.0	4	15	13	3	nw.	C. G. Selvig.
Grand Meadow	Mower	1,338	23	52.3	− 4.3	75	8†	23	3	40	3.70	− 1.14	1.82	T.	5	12	7	12	n.	C. F. Greening.
Hallock	Kittson	815	11	49.2	− 3.6	81	27	18	13	48	1.45	− 0.86	0.35	0.0	9	17	7	7	n.	D. A. Robertson.
Halstad	Norman	870	4	50.2		79	15	18	12	47	0.75		0.26	0.0	7	18	4	9	nw.	Aaron G. Holstrom.
Hinckley	Pine	1,050	5	51.5		80	19	24	3	45	0.45		0.22	0.0	3	6	19	6	s.	W. R. Newman.
International Falls	Koochiching	1,112	2	49.0		76	27	29	3	45	1.32		0.50	0.0	7	20	6	5	w.	Rees Roe.
Kelliher	Beltrami		3																	A. Gilmour.
Lake Crystal	Blue Earth		3			74†	8	28†	1	38†						12[b]	4[b]	7[b]	nw.	W. P. Cobb.
Leech Lake Dam	Cass	1,301	22	48.2	− 2.7	71	14†	20	3	42	1.53	− 1.99	0.45	0.0	10	4	23	4	w.	Hans Olson.
Little Falls	Morrison	1,117	4																	Maurice Coleman.
Little Fork	Koochiching			48.2		76	27	20	3†	48	0.67		0.49	0.0	3	16	11	4		O. C. Olson.
Long Prairie	Todd	1,299	18	50.7	− 3.9	81	19	20	3	45	0.97	− 2.48	0.70	0.0	3	14	8	9	nw.	R. M. Sheets.
Lynd (2)	Lyon	1,175	18	52.8	− 3.3	81	19	22	3	38	2.24	− 1.47	1.16	0.0	5	18	6	7	nw.	J. W. Rouse.
Mankato	Blue Earth	747	11								1.29	− 2.62	0.55	0.0	3	16	8	7	ne.	Sadie H. Blake.
Mapleplain	Hennepin	1,023	18																	G. W. Richards.
Milaca	Millelacs	1,072	13	50.6[a]		79[a]	18	22[a]	3	47[a]	1.30	− 2.31	0.73[a]	0.0	5[a]	8[a]	15[a]	3[a]	nw.	C. H. Foss.
Milan	Chippewa	955	16	52.6	− 4.3	84	19	24	3	44	1.76	− 1.53	1.06	0.0	5	3	25	3	nw.	O. K. Opjorden.
Minneapolis	Hennepin	918	19	54.8	− 2.4	79	18	34	3	31	1.39	− 2.53	1.08	0.0	6	13	7	11	n.	U. S. Weather Bureau.
Montevideo	Chippewa	900	20	55.2	− 1.2	85	20	27	3	44	1.69	− 1.74	0.90	0.0	4	17	9	5	nw.	Lloyd G. Moyer.
Moorhead	Clay	935	29	51.4	− 3.4	81	14	24	12	41	0.92	− 2.03	0.50	0.0	7	20	5	6	nw.	U. S. Weather Bureau.
Mora	Kanabec		5	51.4		81	19	20	3	48	1.05		0.44	0.0	6	20	10	1	w.	Hans Peterson.
Morris	Stevens	1,170	25	53.0	− 3.6	86	19	26	12	43	1.16	− 1.82	0.45	0.0	5	22	6	3	nw.	D. T. Wheaton.
New London	Kandiyohi	1,215	16	49.8	− 5.8	80	18	28	12	39	1.80	− 1.73	0.65	0.0	3	9	18	4	ne.	Harold Swenson.
New Richland	Waseca	1,180	16	53.2	− 4.4	76	8†	25	3	40	1.79		0.68	0.0	6	14	10	7	nw.	N. O. Tyrholm.
New Ulm	Brown	791	30	55.3	− 4.5	82	20	29	3	42	2.01	− 1.50	1.10	0.0	6	19	0	12	s.	Andrew J. Eckstein.
Osakis	Douglas	1,343	3	51.0		80	19	30	12†	40	1.28		0.48	0.0	6	16	7	8	nw.	J. B. Johnson.
Park Rapids	Hubbard	1,426	20	50.7	− 1.6	82	20	24	3	40	0.75	− 2.62	0.32	T.	5	20	1	10	nw.	Dr. P. A. Walling.
Pine River Dam	Crow Wing	1,251	23	50.9	− 1.3	80	19	24	3	41	1.60	− 2.09	0.95	T.	4	15	12	4	nw.	Neil McKay.
Pokegama Falls	Itasca	1,280	23	48.6	− 1.7	74	27	18	3	44	2.20	− 1.28	0.67	0.0	9	16	7	8	nw.	Arthur L. Mampel.
Red Lake	Beltrami	1,152	2	50.2		74	27	25	3	34	0.61		0.24	T.	4	4	19	8	n.	A. C. Goddard.
Red Wing	Goodhue	680	14								2.42		1.02	0.0	5	18[a]	3[a]	9[a]	nw.	Louis Bach.
Redwood Falls	Redwood	1,050	3	54.6		82	18†	27	3	40	3.30		2.47	0.0	3	20	5	6	nw.	N. B. Anderson.
Reeds Landing	Wabasha	681	15								2.93		1.42	0.0	9	19	0	12	nw.	John Deschneau.
Rochester	Olmsted	991	6	52.0		77	19	21	3	43	2.35		1.42	0.0	5	14	5	12	s.	S. R. Case.
Roseau	Roseau	1,040	3	49.1		78	27	21	13	43	1.21		0.20	T.	8	20	5	6	nw.	A. Waag.
St. Charles	Winona	850	19	52.2	− 4.0	76	20	20	3	35	2.81	− 0.91	1.30	0.0	5	17	4	10	se.	S. W. Gleason.
St. Cloud	Sherburne	1,020	32	54.0	− 2.2	80	19	29	3	40	1.90	− 1.93	1.12	0.0	5	17	8	6	nw.	Jos. H. Capser.
St. Paul	Ramsey	837	39	55.2	− 3.0	79	18	32	3	34	1.76	− 1.86	1.37	0.0	9	16	9	6	s.	U. S. Weather Bureau.
St. Peter	Nicollet	825	17	54.6	− 3.1	81	18	25	3	44	1.33	− 2.43	0.75	0.0	4	13	12	6	nw.	Chas. C. Cavanaugh.
Sandy Lake Dam	Aitkin	1,234	17	50.0	− 2.4	75	16	23	3	40	1.85	− 1.43	0.80	0.0	6	20	5	6	nw.	U. S. Engineer Corps.
State Sanatorium	Cass		3	50.9		74	27	27	3	34	1.08		0.46	T.	7	20	1	10	nw.	Walter J. Marcley.
Stillwater	Washington	694	5								1.86		0.78	0.0	6	19	2	10	nw.	Oscar Ostrom.

TABLE 1.—*Climatological data for May, 1910. District No. 5*—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, yrs.	Temperature, in degrees Fahrenheit.							Precipitation, in inches.				Sky.				Prevailing wind direction.	Observers.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall unmelted.	Number of rainy days, .01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days.		
Minnesota—Cont'd.																				
Taylors Falls	Chisago	759	3	53.6	.....	78	19	25	3	42	1.12	.....	1.12	0.0	1	13	9	9	n.	Mpls. Gen. Elec. Co.
Warroad	Roseau	1,069	1	48.2	.....	77	27†	22	3	41	3.44	.....	2.02	.....	9	19	3	9	n.	John H. Sawyer.
West Concord	Dodge	1,232	1	52.4	.....	77	18	25	3	39	1.98	.....	0.92	0.0	4	12	13	6	nw.	H. H. Orcutt.
Willow River	Pine	1,046	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J. A. Brandt.
Windom	Cottonwood	1,336	4	53.8	.....	79	18	25	3	41	1.30	.....	0.82	0.0	3	14	10	7	n.	Taber C. Richmond.
Winnebago	Faribault	1,100	11	.....	.....	85‡	20	33	12†	37‡	1.72	− 3.13	0.60	0.0	6	19	4	8	nw.	H. H. Haight.
Winnibigoshish	Itasca	1,300	22	51.1	− 0.4	72	37	25	3	36	1.90	− 1.14	0.72	0.0	7	21	7	3	nw.	John Duncan.
Winona	Winona	700	15	56.0	− 3.7	79	18†	30	3†	40	2.98	− 2.11	1.33	0.0	7	13	8	10	nw.	Perry C. Myers.
Worthington	Nobles	979	15	51.4	− 5.0	74	19	24	3	36	1.74	− 2.26	0.60	0.0	5	18	1	12	n.	W. I. Carpenter
Zumbrota	Goodhue	917	15	52.6‡	− 5.4	76‡	18	23‡	3	45‡	2.25	.....	0.92	0.0	3	19	7	5	nw.	W. C. Rowell.
South Dakota.																				
Milbank	Grant	1,148	18	52.2	− 3.5	87	19	25	3†	45	0.43	− 3.12	0.32	0.0	3	20	0	11	nw.	I. T. Patridge.
Wisconsin.																				
Antigo	Langlade	1,489	16	50.6	− 3.8	76	27	19	4	42	.....	.....	.....	.....	6	20	2	9	nw.	Elton C. Larzelere.
Barron	Barron	1,115	18	50.2	− 2.8	75	19	19	3	43	2.17	− 2.27	1.32	0.0	4	17	11	3	nw.	Wm. A. Kent.
Beloit	Rock	750	23	54.0	− 4.1	75	20	32	5†	29	3.84	+ 0.27	1.06	0.0	10	17	4	10	ne.	Smith Observatory.
Brodhead	Green	812	12	55.0	− 4.4	78	19	29	4†	38	2.79	− 0.89	0.57	0.0	9	18	10	3	sw.	Hecktore D. Kirkpatrick.
Burnett	Dodge	880	6	51.9	.....	76	19	26	14	36	1.95	.....	0.53	T.	11	14	7	10	se.	Geo. W. Smith.
Delavan	Walworth	920	17	52.6	− 4.5	81	19	25	5†	38	4.07	+ 0.37	1.37	0.0	9	11	8	12	ne.	Elwood S. Austin.
Dodgeville	Iowa	1,116	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Geo. W. Butler
Downing	Dunn	983	8	50.4	.....	80	27	16	3	50	2.69	.....	1.92	0.0	6	11	4	16	nw.	Eugene F. Stoddard.
Eau Claire	Eau Claire	800	19	54.1	− 2.9	78	19	26	3	41	3.08	− 0.98	1.92	0.0	6	17	6	8	nw.	Robert D. Whitford
Ellsworth	Pierce	1,068	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Henry G. Wood.
Glidden	Ashland	1,519	18	48.0	.....	76	19	19	3	45	2.51	.....	1.40	T.	9	17	4	10	ne.	George Sell.
Grand Rapids	Wood	1,021	11	52.1	− 4.3	76	27	26	4	41	1.63	− 2.70	0.60	0.0	6	17	5	9	nw.	Willis B. Raymond.
Grantsburg	Burnett	1,095	19	51.6	− 3.2	79	19	18	4	50	0.93	− 2.96	0.75	0.0	2	12	10	9	nw.	Theodore Olsen.
Hancock	Waushara	1,091	18	53.6	− 3.0	77	19†	26	3	36	1.21	− 2.87	0.52	0.0	8	11	15	5	nw.	Frederick B. Hamilton.
Hatfield	Jackson	973	15	53.1	.....	79	8	26	4	46	2.20	.....	1.17	0.0	5	12	6	13	sw.	Walter S. Woods.
Hayward	Sawyer	1,197	19	47.6	− 5.8	78	19	18	3	44	3.20	+ 0.01	.....	T.	5	3‡	13‡	7‡	n.	William E. Swain.
Hillsboro	Vernon	1,000	19	51.0	− 4.7	78	18	24	4†	45	1.55	− 2.59	0.85	0.0	4	21	7	3	e.	Emil V. Wernick.
Koepenick	Langlade	1,683	20	46.5	− 8.4	74	19†	16	4	48	1.94	− 1.74	1.13	T.	5	4	16	11	nw.	Edward S. Koepenick.
La Crosse	La Crosse	714	38	55.3	− 4.3	78	18	31	4	36	1.63	− 2.12	0.93	0.0	6	12	8	11	n.	U. S. Weather Bureau.
Lake Mills	Jefferson	897	19	52.2	− 4.9	77	20	28	3†	34	3.05	− 0.98	0.74	T.	10	9	11	11	ne.	S. Newton Dexter Smith
Lancaster	Grant	1,070	20	54.1	− 3.7	76	20	31	3†	34	3.86	− 0.49	1.00	0.0	11	17	6	8	w.	Edward Pollock.
Long Lake	Oneida	1,592	2	46.4	.....	78	19	12	4	53	2.50	.....	1.60	0.0	13	14	8	9	nw.	Louie Frank.
Madison	Dane	974	32	53.4	− 4.2	75	18	33	3	29	2.82	− 0.80	0.64	T.	11	11	12	8	ne.	U. S. Weather Bureau.
Mather	Juneau	962	6	51.7	.....	77	19	23	3	41	1.65	.....	0.74	0.0	7	12	8	11	e.	Frank Evans.
Mauston	....do	882	14	53.2	− 2.8	75	19†	28	3†	35	1.35	− 2.92	0.75	0.0	4	17	7	7	nw.	Eugene L. Hitchcock.
Meadow Valley	....do	974	19	51.6	− 4.6	78	20†	23	3	45	1.49	− 2.80	0.73	0.0	4	6	18	7	nw.	Charles H. Johnson.
Medford	Taylor	1,420	19	50.6	− 3.2	74	19	25	4	42	3.85	− 0.50	.....	T.	6	16	7	8	n.	William Zeit.
Merrill	Lincoln	1,267	4	50.8	.....	80	20†	23	4	49	2.07	.....	1.20	T.	6	22	7	2	n.	Frank M. McElroy.
Minocqua	Vilas	1,604	6	47.6	.....	76	19†	17	4	46	3.49	.....	2.30	0.0	9	16	5	10	n.	Benjamin W. Applebee.
Mondovi	Buffalo	738	2	53.2	.....	78	19	23	3	43	3.00	.....	1.64	0.0	8	12	11	8	nw.	Dr. Charles Hebard.
Mount Horeb	Dane	1,226	6	52.1	.....	76	19	28	3	36	3.67	.....	0.95	0.0	11	15	5	11	s.	W. M. Lewis.
Muscoda	Grant	666	1	55.2	.....	82	20	29	5	42	2.30	.....	0.96	0.0	7	13	10	8	ne.	Henry Eckstein.
Neillsville	Clark	996	21	53.0	− 2.3	79	27	23	3	46	1.89	− 1.97	0.50	0.0	4	20	0	11	nw.	William Heaslett.
New Richmond	St. Croix	990	5	53.0	.....	81	19	22	3	45	1.75	.....	0.80	0.0	3	10	17	4	nw.	Franc A. R. Van Meter.
Osceola	Polk	806	19	52.7	− 1.8	80	19	18	3	45	1.64	− 2.53	0.90	0.0	6	13	13	5	e.	Charles W. Staples.
Portage	Columbia	809	14	54.5	− 3.7	79	19†	26	3	40	2.78	− 1.15	1.29	0.0	6	18	9	4	ne.	James Clear.
Prairie du Chien	Crawford	690	23	55.8	− 4.8	79	18	31	4†	39	3.06	− 1.10	1.34	0.0	9	13	4	14	nw.	Jas. A. Gillis.
Prentice	Price	1,551	12	47.8	− 4.9	74	19†	20	3†	45	2.77	− 0.80	1.10	T.	7	16	4	11	nw.	Joseph G. Lash.
Rhinelander	Oneida	1,550	4	49.2	.....	76	19†	22	4	45	2.46	.....	1.65	0.0	11	11	11	9	nw.	John Lind.
Sauk City	Sauk	758	2	54.6‡	.....	79‡	19†	27‡	5	43‡	.....	.....	.....	.....	.....	14‡	4‡	10‡	.....	Kilien Derleth.
Shullsburg	Lafayette	1,019	4	53.2	.....	75	20†	26	4	37	3.70	.....	0.76	0.0	12	13	10	8	nw.	Harrison B. Chamberlin.
Solon Springs	Douglas	1,083	4	48.1	.....	75	27	16	3	46	2.00	.....	0.80	0.0	5	17	6	8	n.	John M. Sayles.
Spooner	Washburn	1,104	15	51.4	− 3.4	78	19	22	3	39	2.44	− 0.87	2.00	0.0	6	21	3	7	nw.	Horace A. Bresee.
Stanley	Chippewa	1,082	6	51.4	.....	74	19	28	3†	41	3.38	.....	2.22	0.0	9	18	5	8	nw.	W. Humphrey Scott.
Stevens Point	Portage	1,113	17	.....	.....	74‡	18†	25‡	4	39‡	1.37	− 2.81	0.70	0.0	3	8‡	8‡	6‡	se.	Garry E. Culver.
Valley Junction	Monroe	930	18	52.8	− 3.5	78	19	25	3	43	2.14	− 2.60	0.89	0.0	7	14	8	9	nw.	Frederick Muermann.
Viroqua	Vernon	1,412	19	54.2	− 2.5	74	19†	28	3	36	1.83	− 3.03	1.05	0.0	5	11	9	11	nw.	Henry E. Rogers.
Vudesare	Vilas	1,600	2	45.4	.....	78	18	15	4	43	2.10	.....	1.00	0.0	9	17	10	4	nw.	Louis L. Thomas.
Watertown	Jefferson	824	19	52.8	− 4.0	77	19	29	4	33	2.87	− 1.06	0.50	T.	12	14	9	8	n.	Charles J. Salick.
Waukesha	Waukesha	864	14	51.8	− 5.2	77	19	28	14	33	3.25	− 0.41	0.83	0.0	8	10	20	1	ne.	Carroll College.
Wausau	Marathon	1,212	17	52.2	− 3.2	76	19	26	3†	40	1.54	− 2.42	0.89	0.0	6	21	4	6	n.	George H. Halder.
Weyerhaeuser	Rusk	1,297	3	49.6	.....	76	19	22	14	47	2.81	.....	1.94	0.0	10	13	14	4	nw.	Miss Etta Stiles.
Whitehall	Trempealeau	675	18	54.2	− 2.7	77	19†	20	3	45	.....	.....	.....	.....	.....	17	0	14	nw.	Henry A. Towner.
Iowa.																				
Albia§	Monroe	959	12	55.4	− 5.6	79	20	34	13	34	3.99	− 0.34	0.91	0.0	14	15	6	10	nw.	J. I. Chenoweth.
Algona§	Kossuth	1,213	36	54.5	− 5.0	79	18	24	3	40	2.00	− 1.68	0.70	0.0	7	18	5	8	ne.	Dr. F. T. Seeley.
Alta	Buena Vista	1,513	19	53.8	− 4.2	79	18	29	3	39	2.97	− 1.81	0.90	0.0	9	11	15	5	nw.	David E. Hadden.
Amana	Iowa	721	34	56.4	− 3.6	80	20	30	4	36	3.17	− 1.23	0.85	0.0	10	14	10	7	ne.	C. Schadt.
Ames	Story	926	34	55.6	− 3.9	80	10	30	7	44	1.79	− 2.53	0.50	0.0	7	12	12	7	n.	Iowa State College.
Baxter§	Jasper	998	10	56.0	− 4.4	82	10	30	4	38	3.38	− 1.82	0.76	0.0	15	16	9	6	nw.	W. R. Vandike.
Belleplaine	Benton	828	20	55.4	− 4.1	80	20	31	4	37	3.02	− 1.64	0.85	0.0	8	12	9	10	se.	S. P. Van Dike.
Belmond	Wright	.....	.....	54.4	.....	79	10	25	3	41	3.52	.....	2.40	0.0	9	13	12	6	nw.	Geo. P. Hardwick.
Bloomfield§	Davis	.....	3	57.6‡	.....	85‡	20†	35‡	4†	39‡	4.09	.....	1.46	0.0	10	.....	.....	.....	sw.	C. R. Davis.
Bonaparte§	Van Buren	.....	19	56.7	− 5.6	81	21	35	4†	33	4.52	+ 0.49	1.75	0.0	11	.....	.....	.....	.....	B. R. Vale.
Boone	Boone	1,134	5	55.5	.....	81	10	32	3	34	1.82	.....	0.47	0.0	12	17	2	12	.....	Carl Fritz Henning.
Britt§	Hancock	1,236	13	53.2	− 4.8	78	18	25	3	41	2.13	− 2.13	1.05	0.0	7	18	5	8	n.	L. M. Goodman.
Buckingham	Tama	.....	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	W. A. Daniel.
Burlington	Des Moines	544	14	57.8	− 6.0	84	21	35	5	36	4.73	− 0.88	1.48	0.0	14	17	10	4	w.	Max E. Poppe, jr.
Carroll	Carroll	1,265	20	53.2	− 5.7	81	9	27	3	38	2.86	− 1.70	0.65	0.0	8	16	5	10	nw.	Mrs. Jos. J. Wolfe.
Cedar Rapids	Linn	733	28	57.0	− 3.0	81	28	35	4†	34	2.51	− 2.07	1.05	0.0	8	17	2	12	e.	W. J. Greene.
Charles City	Floyd	1,015	19	53.9	− 5.6	76	18	28	4	38	2.67	− 2.27	1.37	0.0	9	10	6	15	nw.	U. S. Weather Bureau.
Clear Lake§	Cerro Gordo	1,241	12	55.2	− 4.5	78	9†	28	3	38	3.22	− 2.21	1.60	0.0	4	15	0	16	nw.	Oscar Stevens
Clinton	Clinton	593	43	56.8	− 3.4	80	19	31	5	37	3.19	− 0.87	1.31	0.0	11	10	12	9	.....	Luke Roberts.
Columbus Junction§	Louisa	595	9	57.6	− 4.6	80	20	34	5	33	5.26	+ 1.38	1.65	0.0	11	18	9	4	n.	J. B. Johnston.
Davenport	Scott	580	39	57.2	− 4.3	79	20	38	5	30	3.42	− 0.77	1.14	0.0	15	13	8	10	nw.	U. S. Weather Bureau.
Decorah	Winneshiek	875	17	56.3	− 2.9	83	18†	28	4	46	3.82	− 0.85	2.10	0.0	5	.....	.....	.....	.....	F. H. Baker.
Delaware	Delaware	1,083	19	54.4	− 3.9	80	20	31	3	34	5.30	+ 1.11	1.20	0.0	10	15	10	6	n.	William Ball.
Des Moines	Polk	861	32	56.7	− 4.9	78	10	36	13	32	3.26	− 1.30	1.44	0.0	12	8	9	14	nw.	U. S. Weather Bureau.
De Soto§	Dallas	866	10	56.7	− 5.2	81	10†	28	4	46	2.96	− 0.92	0.61	0.0	10	17	0	14	sw.	R. D. Minard.
Dubuque	Dubuque	639	37	56.2	− 4.6	76	20	36	4	30	3.42	− 0.90	0.92	0.0	13	16	3	12	nw.	U. S. Weather Buerau.
Earlham	Madison	.....	8	55.0	− 5.0	86	20	29	4	40	3.93	− 0.84	0.91	0.0	10	14	5	12	nw.	George Phillips.
Elkader	Clayton	727	31	56.6	− 3.9	81	20	28	4†	42	3.93	− 0.21	1.75	0.0	9	19	5	7	ne.	Chas. Reinecke.
Elma	Howard	.....	1	52.2	.....	77	18	24	4	43	3.33	.....	1.00	0.0	9	14	7	10	nw.	H. A. Moore.
Estherville	Emmet	1,298	15	53.0	− 4.2	80	18	24	3	38	1.52	− 2.66	0.51	0.0	9	17	0	14	nw.	A. O. Peterson.

TABLE 1—*Climatological data for May, 1910. District No. 5*—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, yrs.	Temperature, in degrees Fahrenheit.							Precipitation, in inches.				Sky.				Prevailing wind direction.	Observers.
				Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall unmelted.	Number of rainy days, .01 inch or more.	Number of clear days.	Number of partly cloudy days.	Number of cloudy days		
Iowa—Cont'd.																				
Fairfield	Jefferson	.....	26	56.9	— 3.3	81	21	33	4	31	3.75	— 1.53	1.12	0.0	14	19	5	7	nw.	R. Monroe McKenzie.
Fayette§	Fayette	1,003	20	54.0	— 3.4	77	20†	27	4	36	2.82	— 1.98	0.77	0.0	7	17	7	7	nw.	R. Z. Latimer.
Forest City§	Winnebago	1,226	16	53.4	— 4.9	80	18	26	3	40	2.14	— 2.25	1.00	0.0	6	18	3	10	w.	J. A. Peters.
Fort Dodge	Webster	1,126	10	54.6	— 5.4	82	10	29	4	42	2.48	— 2.06	1.03	0.0	10	20	0	11	n.	J. F. Monk.
Fort Madison	Lee	516	61	.....	.....	.....	.....	.....	.....	.....	6.32	+ 1.92	1.37	0.0	9	6	10	15	s.	Miss L. A. McCready.
Gilman	Marshall	1,052	11	.....	.....	.....	.....	.....	.....	.....	4.13	+ 0.31	1.62	0.0	7	.....	.....	.....	.....	J. L. Wylie.
Grand Meadow	Clayton	1,180	19	53.8	— 4.3	75	18	29	4	35	3.94	— 0.92	2.12	0.0	10	15	6	10	nw.	F. L. Williams.
Greene	Butler	.....	12	55.4	— 4.0	83	27	27	3	49	3.09	— 1.55	0.89	0.0	9	11	9	11	w.	J. L. Cole.
Grinnell	Poweshiek	1,023	18	59.0	— 0.7	82	10	38	3	34	3.89	— 0.70	0.97	0.0	11	15	10	6	nw.	D. W. Brainard
Grundy Center§	Grundy	976	19	56.0	— 2.5	81	10	28	4	37	2.83	— 2.33	0.80	0.0	7	12	11	8	nw.	J. B. Calderwood.
Guthrie Center§	Guthrie	1,077	15	55.3	— 5.3	80	20	28	4	41	3.37	— 1.59	0.78	0.0	14	15	7	9	nw.	D. G. Beardsley.
Hampton	Franklin	1,155	20	54.8	— 3.5	81	18	28	3	41	1.97	— 2.61	0.75	0.0	7	13	9	9	nw.	E. C. Grenelle.
Humboldt	Humboldt	1,095	22	54.8	— 4.6	81	18	23	3	44	2.64	— 1.72	1.65	0.0	8	22	2	7	nw.	Henry S. Wells.
Independence§	Buchanan	921	46	54.8	— 5.3	76	20†	29	4	37	2.63	— 1.59	0.90	0.0	7	19	6	6	nw.	George Donohoe.
Indianola	Warren	969	19	56.5	— 4.2	80	20	34	3	33	3.57	— 1.07	0.72	0.0	13	10	7	14	nw.	John L. Tilton.
Iowa City	Johnson	683	50	55.6	— 4.7	78	20†	33	4†	36	3.57	— 0.80	0.73	0.0	13	16	3	12	se.	A. G. Smith.
Iowa Falls	Hardin	1,170	17	53.9	— 4.8	80	27	28	4	43	1.81	— 2.39	0.87	0.0	4	18	0	13	nw.	J. B. Parmelee.
Jefferson§	Greene	.....	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	G. W. Jackson.
Keokuk	Lee	547	39	59.0	— 4.2	82	21	37	5	28	6.87	+ 2.52	2.99	0.0	15	16	8	7	nw.	U. S. Weather Bureau.
Keosauqua	Van Buren	644	18	57.2	— 5.4	85	21	34	4	39	4.81	+ 0.44	1.82	0.0	15	8	11	12	.....	J. H. Landes.
Knoxville§	Marion	920	15	57.6	— 4.6	83	20	35	4	37	3.06	— 0.51	0.70	0.0	12	15	6	10	nw.	Casey & Belville.
Lacona	Warren	.....	11	.....	.....	.....	.....	.....	.....	.....	3.68	— 1.54	1.00	0.0	12	7	19	5	.....	J. B. Alter.
Le Claire	Scott	576	10	.....	.....	.....	.....	.....	.....	.....	4.11	— 0.32	0.89	0.0	15	.....	.....	.....	.....	Miss M. T. Disney.
Marshalltown	Marshall	947	18	54.8	— 4.9	81	10	30	4†	40	3.31	— 1.42	1.07	0.0	10	19	3	9	nw.	Ralph B. Reasoner.
Mason City§	Cerro Gordo	1,132	13	52.6	— 5.8	77	18	24	3†	43	2.32	— 2.34	1.10	0.0	6	14	8	9	nw.	J. S. Mills.
Mount Pleasant§	Henry	729	29	57.6	— 4.6	89	21	34	4†	41	4.25	+ 0.07	1.76	0.0	11	14	8	9	nw.	J. W. Edwards.
Muscatine	Muscatine	.....	50	.....	.....	.....	.....	.....	.....	.....	4.39	+ 0.01	1.25	0.0	13	.....	.....	.....	.....	William Molis
New Hampton§	Chickasaw	1,189	13	54.5	— 3.4	79	8	32	4	37	2.91	— 1.73	0.85	0.0	5	20	3	8	w.	A. F. Kemman.
Newton§	Jasper	944	22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J. P. Beatty.
Northwood§	Worth	1,222	14	53.5[c]	— 4.4	77[b]	19	27[b]	3	38[c]	2.66	— 2.32	1.03	0.0	6	17	6	8	nw.	Chas. H. Dwelle.
Olin§	Jones	760	12	56.4	— 3.6	81	10	30	4†	42	3.36	— 1.13	1.15	0.0	9	15	10	6	nw.	C. M. Miles.
Osage	Mitchell	1,184	23	55.2	— 1.9	77	8†	25	3	41	3.49	— 1.29	1.11	0.0	5	16	6	9	nw.	A. D. Bundy.
Oskaloosa§	Mahaska	843	34	57.1	— 3.3	82	20	34	13	39	3.55	— 0.13	0.81	0.0	10	16	2	13	nw.	Joseph Boyd.
Ottumwa	Wapello	649	15	59.0	— 4.0	83	30	39	4†	37	2.57	— 2.07	0.56	0.0	11	5	3	23	nw.	W. J. Mesmer.
Pella	Marion	877	8	56.2	— 5.1	81	9†	29	4	41	2.94	— 1.38	0.74	T.	14	23	1	7	nw.	John H. Ver Steeg.
Perry§	Dallas	975	9	56.1	— 5.8	81	10	31	4	43	3.02	— 1.98	0.55	0.0	7	13	10	8	.....	J. A. Harvey.
Plover	Pocahontas	1,420	14	53.9	— 5.2	82	18	22	3	44	1.29	— 2.98	0.55	0.0	5	19	8	4	nw.	J. S. Smith.
Pocahontas§	....do	1,248	6	53.5	.....	80	18	24	3	40	1.97	.....	0.90	0.0	8	17	6	8	nw.	F. E. Hronek.
Ridgeway§	Winneshiek	1,215	12	55.4	— 4.2	79	31	28	3	36	4.12	— 1.25	2.10	0.0	10	20	5	6	s.	Arthur Betts.
Rockwell City§	Calhoun	.....	14	55.7	— 3.8	80	18	29	3	40	3.90	— 0.84	1.40	0.0	7	17	9	5	.....	C. M. Randall.
Sac City	Sac	1,278	34	54.9[b]	— 3.7	80[b]	10	30[b]	3†	38[b]	2.39	— 1.84	1.11	0.0	6	.....	.....	.....	nw.	E. N. Baily.
St. Charles§	Madison	1,070	9	56.6	— 5.3	81	20	34	3	34	3.45	— 1.47	0.80	0.0	12	15	9	7	nw.	R. D. Minard.
Sigourney§	Keokuk	877	14	56.6	— 6.4	79	10†	34	4	36	2.98	— 1.15	0.71	0.0	9	5	22	4	nw.	J. T. Parker.
Stockport§	Van Buren	.....	8	56.0	.....	82	21	30	4	38	4.03	+ 0.27	1.57	0.0	13	14	8	9	nw.	C. L. Beswick.
Storm Lake	Buena Vista	1,440	21	53.9	— 3.7	77	18	26	3	37	2.77	— 1.11	1.03	0.0	7	18	7	6	n.	S. B. Fracker.
Stuart	Guthrie	1,216	11	55.2[d]	— 6.0	83[d]	20	31[d]	3	36[d]	.....	.....	.....	0.0	.....	.....	.....	.....	.....	J. P. Fox.
Tipton §	Cedar	807	11	58.8	— 1.7	79	20	38	5†	34	4.35	— 0.83	1.92	0.0	9	18	11	2	nw.	F. K. Gregg.
Toledo§	Tama	856	16	56.7	— 4.0	80	1	33	14	26	3.59	— 0.60	0.82	0.0	10	16	8	7	nw.	I. F. Giger.
Wapello§	Louisa	588	12	57.6	— 5.0	79	20†	36	5	30	3.41	— 0.48	1.13	0.0	8	14	12	5	nw.	G. W. Schofield.
Washington	Washington	769	28	56.6	— 4.4	79	20†	35	4†	36	3.57	+ 0.06	1.01	0.0	10	12	11	8	nw.	Wm. A. Cook.
Waterloo	Black Hawk	862	27	56.2	— 3.3	78	9	31	4	38	2.05	— 1.91	0.81	0.0	10	.....	.....	.....	.....	M. L. Newton.
Waukee	Dallas	1,039	7	55.6	.....	78	10†	30	3	37	3.08	— 1.87	0.68	0.0	14	13	12	6	nw.	Samuel F. Foft.
Waverly§	Bremer	948	14	54.8	— 5.2	79	20	30	3†	38	1.97	— 2.73	0.63	0.0	8	9	13	9	e.	H. S. Hoover.
Webster City§	Hamilton	.....	5	56.4	.....	85	10	26	4	48	1.83	.....	0.57	0.0	6	14	9	8	nw.	C. D. Carpenter.
West Bend§	Palo Alto	1,197	17	54.0	— 4.6	80	18	28	13	41	1.59	— 2.04	0.58	0.0	6	12	10	9	nw.	Joseph Dorweiler.
Whitten§	Hardin	1,036	13	55.8	— 3.5	81	10	30	3†	38	2.19	— 2.17	1.00	0.0	5	16	8	7	nw.	F. P. Butler.
Winterset§	Madison	1,129	19	56.9	— 4.3	81	10	34	3†	40	4.68	+ 0.22	0.95	0.0	13	10	9	12	n.	Robert S. Cooper.
Zearing	Story	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Orley Reese.
Missouri.																				
Gorin	Scotland	700	24	.....	.....	.....	.....	.....	.....	.....	6.19	+ 1.80	1.84	0.0	11	9	8	14	nw.	J. W. Pulliam.
Hannibal	Marion	534	18	58.4	— 6.0	82	28	39	13	27	6.58	+ 1.58	1.72	0.0	16	10	10	11	nw.	U. S. Weather Bureau.
Louisiana	Pike	500	32	58.8	— 4.9	84	10	34	5†	39	7.34	+ 2.87	1.55	0.0	14	15	6	10	se'	J. T. Farrell.
Mexico	Audrain	797	32	58.6	— 5.9	84	10†	37	4†	41	8.48	+ 3.69	2.10	0.0	16	14	2	15	e.	J. F. Llewellyn.
Steffenville	Lewis	576	17	58.6	— 5.1	83	21	36	4	30	8.58	+ 3.19	2.32	0.0	12	11	13	7	ne.	Lewis Spriggs.
Sublett	Adair	1,000	30	57.8	— 4.6	89	28	35	13	36	9.85	+ 4.31	2.00	0.0	10	6	14	11	nw.	Frank Hall.
Warrenton	Warren	865	20	59.9	— 4.9	87	20	37	4	36	6.58	+ 1.75	1.63	0.0	16	10	6	15	s.	Dr. J. H. Frick.
Indiana.																				
Collegeville	Jasper	.....	11	54.7	— 6.4	80	22	28	4	39	6.40	+ 2.13	2.70	0.0	10	4	12	15	n.	Prof. L. C. Klosterman.
Knox§	Starke	716	5	55.2	.....	80	22	30	5†	36	5.07	.....	1.03	0.0	13	14	9	8	nw.	W. R. R. Tatman.
Laporte	Laporte	810	14	54.5[c]	.....	81[c]	22	34[c]	4	33[c]	6.31	+ 2.20	1.38	0.0	15	17[b]	6[b]	6[b]	n.	J. E. Hallinen.
Plymouth	Marshall	790	7	53.4	.....	77	22	30	14	32	4.54	.....	1.10	0.0	11	10	14	7	nw.	J. W. Siders.
Illinois.																				
Aledo	Mercer	738	10	56.2	— 4.2	79	20†	30	5	32	4.37	— 0.14	1.58	0.0	13	10	12	9	ne.	Wm. B. Frew.
Alexander	Morgan	670	17	57.8	— 5.7	81	28	32	4	32	5.25	+ 0.95	1.19	0.0	12	8	10	13	nw.	George H. Hall.
Antioch	Lake	861	9	52.4	.....	80	19†	28	5†	38	4.94	.....	1.68	0.0	5	9	11	11	ne.	J. C. James, jr.
Astoria	Fulton	650	11	57.0	— 4.3	81	28	33	4	32	6.33	+ 2.40	1.27	0.0	11	11	10	10	nw.	Ed. V. Bohl.
Aurora	Kane	687	31	53.8	— 5.1	80	21†	29	5†	35	6.20	+ 2.08	2.24	0.0	12	7	11	13	se.	W. Holden.
Bement	Piatt	700	3	57.7	.....	80	20†	29	4	39	7.15	.....	1.45	0.0	10	19	3	9	s.	Rev. C. S. Adams.
Benton	Franklin	598	8	62.6	.....	83	21†	40	5†	36	4.17	.....	1.45	0.0	8	5	10	16	sw.	F. H. Stamper.
Bloomington	McLean	840	19	57.2[a]	— 5.6	81[a]	22†	31	4†	37[a]	5.31	+ 0.57	1.92	0.0	10	14	9	8	ne.	Prof. H. N. Pearce
Cairo	Alexander	359	33	63.9	— 3.6	85	11	45	5	29	2.86	— 0.97	1.69	0.0	14	6	8	17	se.	U. S. Weather Bureau.
Carbondale	Jackson	412	.....	63.6	.....	88	29	35	5	37	2.81	.....	1.13	0.0	10	10	6	15	sw.	State Normal University.
Carlinville	Macoupin	663	20	59.4	— 4.4	83	20	34	4	32	6.52	+ 2.15	1.32	0.0	14	12	8	11	s.	R. O. Purviance.
Chester	Randolph	380	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	F. A. Gollon, jr.
Clinton	Dewitt	727	.....	56.8	.....	79	28	30	4	35	5.50	.....	1.40	0.0	12	14	11	6	nw.	J. F. Ziegler.
Coatsburg	Adams	763	18	59.8	— 3.8	87	28	34	4	32	6.62	+ 2.31	1.44	0.0	11	10	9	12	se.	Dr. J. R. Lambert.
Cobden	Union	656	27	63.6	— 3.2	87	29	39	14	36	3.66	— 0.94	1.25	0.0	11	6	16	9	s.	John Buck.
Dakota	Stephenson	929	5	53.4	.....	75	18†	30	4†	35	2.32	.....	0.53	0.0	11	13	14	4	nw.	Rev. G. W. Kerstetter.
Decatur	Macon	685	19	57.4	— 5.6	81	29	32	4	33	7.16	+ 3.05	1.53	0.0	12	15	9	7	sw.	Prof. J. H. Coonradt.
Dixon	Lee	725	20	55.7	— 3.8	79	28	30	5	36	4.22	— 0.75	0.88	0.0	11	17	6	8	.....	H. V. Bardwell.
Du Quoin	Perry	459	22	62.8	— 4.2	85	29	38	14	33	2.99	— 0.84	0.73	0.0	10	7	19	5	sw.	G. H. Knetzger.
Dwight	Livingston	600	17	55.4	— 5.4	83	22	30	4†	37	5.11	+ 1.52	1.82	0.0	12	5	14	12	nw.	Ed. O. Welch.
Galva	Henry	842	18	55.9	— 4.9	80	21†	32	4†	33	5.55	+ 1.45	2.03	0.0	16	15	0	16	ne.	Prof. F. U. White.
Greenville	Bond	635	32	61.0	— 3.0	83	20	37	4	31	3.76	— 0.98	1.45	0.0	10	17	3	11	nw.	M. S. Oudyn.
Griggsville	Pike	650	25	59.0	— 4.9	81	28	35	4†	29	6.86	+ 1.90	1.84	0.0	11	11	10	10	se.	Geo. F. Kneeland.
Halfway	Williamson	569	14	62.4	— 4.4	85	29	40	14	31	4.50	+ 1.22	1.85	0.0	12	12	4	15	s.	E. L. Hearn.
Havana	Mason	475	18	59.4	— 4.2	86	28	34	5	34	7.34	+ 3.47	2.44	0.0	10	11	17	3	ne.	F. & C. Borgelt.

TABLE 1.—*Climatological data for May, 1910. District No. 5*—Continued.

Stations.	Counties.	Elevation, feet.	Length of record, yrs.	Temperature. in degrees Fahrenheit. Mean.	Departure from the normal.	Highest.	Date.	Lowest.	Date.	Greatest daily range.	Precipitation, in inches. Total.	Departure from the normal.	Greatest in 24 hours.	Total snowfall unmelted.	Number of rainy days, .01 inch or more.	Sky. Number of clear days.	Number of partly cloudy days.	Number of cloudy days.	Prevailing wind direction.	Observers.
Illinois—Cont'd.																				
Henry	Marshall	500	22	57.0	— 4.1	82	21	31	5	36	6.00	+ 1.78	2.00	0.0	12	16	10	5	ne.	Dr. F. A. Powell.
Hillsboro	Montgomery	675	16	58.2	— 6.2	82	20†	34	4	34	6.03	+ 1.34	2.10	0.0	11	17	2	12	nw.	Ira L. Woodward.
Joliet	Will	541	19	54.6	— 5.9	82	21†	32	5†	37	4.90	+ 0.98	1.28	0.0	11	12	7	12	ne.	F. M. Muhlig.
Kishwaukee	Winnebago	730	22	54.6	— 3.3	76	19†	29	5	34	4.25	+ 0.14	1.06	0.0	14	10	12	9	se.	Geo. Stevens.
La Grange	Cook	657	18	54.0[b]	— 4.1	82[b]	22	31[b]	4†	40[b]	5.13	+ 1.38	1.25	0.0	11	11	12	8	w.	Prof. F. E. Sanford.
La Harpe	Hancock	698	31	56.8	— 5.8	84	21	33	5	36	6.88	+ 2.43	3.20	0.0	12	17	5	9	sw.	Jno. S. Campbell.
Lanark	Carroll	883	21	53.3	— 5.2	76	19†	24	5	39	3.31	— 1.17	0.99	T.	9	22	5	4	nw.	M. N. Wertz.
La Salle	La Salle	536	33	56.0	— 4.8	82	21	34	4	30	6.02	+ 2.10	1.55	0.0	15	11	8	12	ne.	U. S. Weather Bureau.
Lincoln	Logan	482	22	57.6	— 5.1	84	20	30	4†	35	5.97	+ 2.05	1.01	0.0	10	12	12	7	s.	Prof. C. S. Oglevee.
Martinton	Iroquois	633	23	55.2[a]	— 5.1	84[a]	22	30	4†	41[a]	4.47	— 0.22	1.30	0.0	12	12	9	10	n.	Jos. H. Peltier.
Mascoutah	St. Clair	425	20	62.5[a]	— 1.7	87[a]	20†	37	4†	34[a]	5.22	+ 0.30	2.95	0.9	8	11	11	9	se.	Geo. Henrich.
Minonk	Woodford	745	17	56.8	— 5.2	86	22	30	4	38	4.52	+ 0.68	1.53	0.0	11	16	8	7	se.	O. M. Davison.
Monmouth	Warren	784	18	57.6	— 4.1	87	21	30	5	36	4.66	+ 0.66	2.25	0.0	14	14	5	12	nw.	Hugh R. Moffet.
Morrison	Whiteside	685	16	55.0	— 4.9	76	18	29	5	36	3.15	— 1.67	0.68	0.0	13	13	11	7	nw.	S. A. Maxwell.
Morrisonville	Christian	638	11	57.4	— 5.3	80	20	32	4	34	8.65	+ 4.88	2.82	0.0	12	16	7	8	sc.	J. D. Lowis.
Mount Vernon	Jefferson	511	16	61.6	— 4.2	85	1	37	14	34	2.61	— 1.38	1.15	0.0	11	15	4	12	s.	Theo. P. Stelle.
Oregon	Ogle	702	1	54.2	.....	78	19	28	5	35	4.65	.....	1.00	0.0	9	8	9	14	w.	Samuel Ray.
Ottawa	La Salle	500	24	57.2	— 3.9	85	21†	30	5	36	5.28	+ 1.05	1.70	0.0	11	10	2	19	ne.	Miss M. M. Harris.
Pana	Christian	692	24	58.8	— 4.1	81	20	33	4	31	6.06	+ 1.62	1.28	0.0	11	21	4	6	nw.	C. W. Sibley.
Peoria	Peoria	609	33	56.4	— 5.3	82	28	35	13	32	4.49	+ 0.23	1.15	0.0	15	14	11	6	ne.	U. S. Weather Bureau.
Pontiac	Livingston	546	8	57.0	.....	83	22†	32	5	36	5.04	.....	1.42	0.0	10	11	11	9	sw.	Geo. Butterworth.
Riley	McHenry	956	51	53.6	— 3.8	75	18†	31	4	33	4.42	+ 0.75	1.25	0.0	13	9	8	14	nw	John West James.
Rockford	Winnebago	763	18	54.6	— 3.6	77	20	30	5	33	4.76	+ 0.58	1.95	0.0	14	14	4	13	.....	Hosmer C. Porter.
Rushville	Schuyler	670	19	58.2	— 4.7	80	28	34	4	27	6.11	+ 1.68	1.15	0.0	11	6	15	10	s.	H. F. Dyson.
St Charles	Kane	700	15	54.2	— 5.5	80	21†	29	5†	36	6.43	+ 2.15	1.45	0.0	14	12	16	3	ne.	Dr. Wm. H. Bishop.
St. Peter	Fayette	500	8	59.9	.....	84	20	34	14	33	3.86	.....	1.05	0.0	8	11	13	7	nw.	M. L. Lansford.
Springfield	Sangamon	644	33	58.8	— 4.7	82	28	34	4	29	4.39	— 0.10	0.92	0.0	15	14	5	12	s.	U. S. Weather Bureau.
Streator	La Salle	626	17	56.2	— 4.9	85	21†	31	4†	39	5.13	+ 1.60	1.91	0.0	12	20	8	3	se.	Edw. F. Sweetser.
Sullivan	Moultrie	530	10	58.3	— 4.3	81	20†	32	4	42	6.75	+ 2.06	1.43	0.0	11	12	10	9	sw.	C. A. Corbin.
Sycamore	De Kalb	855	30	54.7	— 3.4	82	22	28	5†	42	4.81	+ 0.62	0.73	0.0	13	16	0	15	sw.	Miss E. J. Davis.
Tilden	Randolph	500	24	61.4	— 3.8	88	22	40	14	30	5.46	+ 1.46	1.81	0.0	13	16	4	11	nw.	Jas. A. Caldwell.
Tiskilwa	Bureau	798	16	56.0	— 5.0	82	21	31	4	35	7.10	+ 2.67	1.71	0.0	14	17	4	10	w.	F. L. Smucker.
Walnut	....do	717	19	57.4[d]	— 4.6	80[b]	21	32[a]	4†	35[b]	4.84	+ 0.35	2.06	0.0	14	11	14	6	ne.	O. C. Nussle.
White Hall	Greene	573	2	58.0	.....	81	28	34	4	34	7.18	.....	1.63	0.0	14	13	6	12	nw.	Dr. R. A. Pritchett.
Windsor	Shelby	681	11	57.8	— 4.6	83	21	31	4†	36	6.32	+ 0.72	1.94	0.0	10	9	11	11	s.	Herbert Rose.
Winnebago	Winnebago	900	23	54.2	— 3.8	78	20	29	14	37	4.73	+ 0.44	1.40	0.0	12	12	10	9	ne.	Frank Osborn
Yorkville	Kendall	584	23	54.8	— 3.2	83	21	28	5†	40	4.49	+ 0.27	1.00	0.0	11	13	5	12	w.	Herman A. Grimwood.
Zion	Carroll	938	16	55.1	— 4.2	78	19†	29	5	37	3.84	— 0.57	1.98	0.0	7	17	5	9	w.	Robt. F. Gillogly.

[a], [b], [c], etc., indicate, respectively, 1, 2, 3, etc. days missing from the record.
* Precipitation included in that of the next measurement.
** Temperature extremes are from observed readings of the dry-bulb; means are computed from observed readings.
† Also on other dates.
‡ Separate dates of falls not recorded.
§ Data are from standard instruments not supplied by the U. S. Weather Bureau.
§§ Instruments are read in the morning; the maximum temperature then read is charged to the preceding day, on which it almost always occurs.
‖ Estimated by observer.
‖‖ Precipitation for the 24 hours ending on the morning when it is measured.
T. Precipitation is less than 0.01 inch rain or melted snow.

TABLE 2.—*Daily precipitation for May, 1910. District No. 5, Upper Mississippi Valley.*

Stations.	River basins.	Day of month.																													Total.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
North Dakota.																																	
Amenia	Red															T.	.70	.10	T.	T.				T.					T.				0.80
Bottineau	Mouse	.12													T.	.18	.48		T.	.13	.03			.34					.21	.15	.06		1.70
Cando	Sheyenne	.30													.30		.11						.21										0.92
Crosby	Mouse													T.	.18	.63	.48		.05	.38		T.	T.	.05					.41	.02		T.	2.21
Devils Lake	Sheyenne	.01				T.									.20	.03	.12		.05	.33			.13	T.					.01		T.	.03	0.91
Donnybrook	Mouse													.10	.20	.75		T.	.13	.14		T.	.11						.23	T.			1.66
Dunseith	....do				T.										T.	.28	.30		T.				.33					.65					1.56
Edmore	Sheyenne	.15													T.	.20	.30			.50			.05									T.	1.20
Forman	....do															.36			.18		T.										.10		0.64
Grafton	Red																																
Granville	Mouse														T.	.06	.19		.06	.32			.12						.06	T.			0.81
Hannah	Pembina	.02														.41	T.		.11	.09			.08	T.	T.				.06	.02		T.	0.79
Hansboro	Red	.09													.05	.33	.32			.17	.01		.20	.01					.16			.05	1.39
Hillsboro	....do															.36		.12	.13					.19									0.80
Lakota	Sheyenne	.01													.18	.19	.41	T.	.04	.20	.01		.09		T.						.03	.10	1.26
Langdon	Pembina	.21														.04	.33			.02				.08					.07	T.			0.75
Larimore	Red	.10														.34	.18	.24		.19									.06				1.21
Lisbon	Sheyenne					T.	T.									.10	.53	.40						.08					.03	T.	.02		1.16
McKinney	Mouse													T.	T.		.85		T.		T.	T.							.25				1.10
Manfred	Sheyenne	T.				T.									.28	.05	.20		.03	.24			.04										0.84
Mayville	Red																.34		.19	.09				.07									0.69
Minot	Mouse	.11														.11	.53		.05	.17	T.			.12					.03			.01	1.13
Minto	Red	.17												.07	.58	.77	.27		.07	.05			.14	.01				.07					2.20
Oriska	Sheyenne															.16	.22	T.	.04				.01						.04			.09	0.56
Park River	Red	T.													.08	.33	.05		.02	.18			.02	.06									0.74
Pembina	....do	.22														.18	.32	.08		T.	.22		.22		.08				T.	.10		.14	1.46
Portal	Mouse																																
Power	Sheyenne			T.		T.										.28	.31							T.							T.	0.59
Pratt	Mouse				.12									.12		.45							.19					.10				0.98
University	Red														.06	.12	.28							.01						.03			0.50
Wahpeton	....do														T.	.46							.11	T.									0.57
Walhalla	Pembina																																
Westhope	Mouse													.10	.03	.90				.33			.01						.02				1.39
Willow City	....do															.20	.33	T.	T.	.08			.10								.18		0.89
Minnesota.																																	
Albert Lea	Mississippi										.15	.20				.10	.40	.75				.85		T.					.05			T.	2.50
Alexandria	....do									T.						.45	.27	.22							.13	T.				T.			1.07
Angus	Red														.17	.12	.22			.02			T.	.18	T.					T.			0.71
Bagley	....do															.03	.22	.04	.14					.28	.42				.17	.01			1.31
Baudette	Rainy	T.													T.		.14	.02	.01	.13				.17	.22				.48	.09			1.26
Beardsley	Minnesota																																
Beaulieu	Red																.45	.04	.04	.39				.36	.12				T.	.01			1.41
Bird Island	Minnesota	T.	T.				T.									T.	.02	1.07			.35	.06							.04				1.54
Caledonia	Mississippi		T.														T.	1.20	.11				.55							.01			1.87
Campbell	Red															T.	.20	.16			.06			.10	T.				T.				0.52
Cass Lake	Mississippi								T.							T.		.65		.50				.15							T.			1.30
Collegeville	....do														.01		.14	.69			.48				.03				T.			.04	1.39
Crookston	Red	T.													T.	.12	.10	T.	T.	.19	T.			.06	.12	.02			T.	.05				0.66
Detroit	....do	T.								T.						.11	.32	.18	T.	T.	.03			.16	.26	.05			T.	T.				1.11
Fairmont (near)	Minnesota		.07				T.					10				T.	.35	.44			.30	.24		T.					.75				2.25
Faribault	Mississippi															T.	.31	.61			.13	.47	.01						.02	.01		.06	1.62
Farmington	....do	T.															T.	1.07			T.	.40		T.	T.				.07				1.54
Fergus Falls	Red					T.			T.							.03	.36	.10	T.					.11	.01				.02				0.63
Fort Ripley	Mississippi															T.	T.	.95	T.						T.	T.					T.			0.95
Fosston	Red															.02	.18	.05	.04	.10				.25	.14				.05	.04				0.87
Glencoe	Mississippi															T.	T.	1.45			.30	.20		T.					T.			.20		2.15
Grand Meadow	....do										T.						.06	.66	1.82			T.	1.03		T.	T.			.13			T.		3.70
Hallock	Red	.05													.05	.25	T.			.15	.35			.05	.35					.10			.10	1.45
Halstad	....do	T.														.14	.19	.07	.02	.26				.04	.03							T.	0.75
Hinckley	St. Croix								T.												.22	.13			.10				T.					0.45
International Falls	Rainy	T.	.05												.12		.05			.07				.33	.50				T.	.20				1.32
Kelliher	Red																																
Lake Crystal	Minnesota																																
Leech Lake Dam	Mississippi										.01					.02	.45	.41	.02	.26				.10	.17				.07	.02				1.53
Little Falls	....do																																
Little Fork	Rainy																	.02						.49	.16								0.67
Long Prairie	Mississippi															.70		.12		T.				.15									0.97
Lynd (2)	Minnesota	.23					.06				.18					T.		.61			1.16	T.		T.					T.			T.		2.24
Mankato	....do																	.55	.30				.44											1.29
Mapleplain	Mississippi																																
Milaca	....do																																
Milan	Minnesota														.03	.14	.50		1.06	.03									T.				1.76
Minneapolis	Mississippi	T.							T.							.01	.18	.90		.18	T.	.10		T.	T.				.02				1.39
Montevideo	Minnesota						T.								T.		.02	.75			.90				T.					.02			1.69
Moorhead	Red	.04													.16	.08	.50		.06			.01	.07										0.92
Mora	St. Croix																.09	.44			.32	.14		.05	.01								1.05
Morris	Minnesota														.01	.05	.45	.22		.43				T.									1.16
New London	Mississippi														T.	T.	.34	.51			.65			T.									1.50
New Richland	Minnesota										.04					T.	.36	.61				.68		T.					.04			.06	1.79
New Ulm	....do		T.														.05	1.10	.21		.33		.25	T.						.07			2.01
Osakis	Mississippi								T.						.20	.48	.26	.31			.02			.01	T.									1.28
Park Rapids	....do																.13	.32		T.				T.	.14	.04			T.	.12	T.		0.75
Pine River Dam	....do																.45	.95		.10	T.			.10	T.				T.	T.			1.60
Pokegama Falls	....do							T.								T.	.40	.67	.04	.64	.07			.12	.15				.04	.07			2.20
Red Lake	Red														T.	T.	.24	.10	T.	.05				.22						T.		T.	0.61
Red Wing	Mississippi									T.						T.	1.02	.16		.20		1.02			.02					T.			2.42
Redwood Falls	Minnesota															T.	T.	.80			2.47	T.							.03				3.30
Reeds Landing	Mississippi																.01	1.42	.08		.08		1.20		.06	.04			.02	.02			2.93
Rochester	....do															T.		1.42	.10		.08	.05	.70						T.				2.35
Roseau	Red	.14														.16	.11		.13	.12				.17	.20				.18	T.			1.21
St. Charles	Mississippi																	1.30	.10				1.30		.01					.10			2.81
St. Cloud	....do															T.	.05	1.12			.71	T.		.01	.01								1.90
St. Paul	....do	T.														.03	.30	1.09		.07	.05	.16	.01	T.	.02				.03				1.76
St. Peter	Minnesota	T.														.09	.75			.17	.32		T.							T.		T.	1.33
Sandy Lake Dam	Mississippi																.07	.60			.80			T.	.10				.25	.03			1.85
State Sanatorium	....do															.05	.33	.46		.03				.08	.04				.09	T.			1.08
Stillwater	St. Croix		T.														.06	.62	.78				.16		.18					.06			1.86
Taylors Falls	....do															T.		1.12						T.	T.				T.				1.12
Warroad	Rainy	.13													.01	2.02	T.	.02	.24	T.				.14	.23				.61	.94			3.44
West Concord	Mississippi																.22	.82				.92	.02						T.				1.98
Willow River	St. Croix																																
Windom	Des Moines	T.				T.				T.		.43				T.	T.	.82			.05	T.		T.					T.				1.30
Winnebago	Minnesota							T.				.25					T.	.57	.20		.05		.60		T.					.05			1.72
Winnibigoshish	Mississippi																.24	.48	.10	.72				.13	.15				.08				1.90

TABLE 2.—*Daily precipitation for May, 1910. District No. 5*—Continued.

Stations.	River basins.	Day of month. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Minnesota—Cont'd.																																	
Winona	Mississippi																.75	.79				1.33	.05	.03	.02				.01				2.98
Worthington‖	Des Moines		.35				.13	.48			T.	.18					T.	.60			T.												1.74
Zumbrota	Mississippi															T.	.55	.78		T.	.92	T.							T.				2.25
South Dakota.																																	
Milbank	Minnesota						.03										.08	.32			T.			T.					T.			T.	0.43
Wisconsin.																																	
Antigo	Wisconsin																																
Barron	Chippewa																T.	1.32	.15		T.	*	.55		T.				.15				2.17
Beloit	Rock		.69						.20		.03					.05		.56		.06		1.06	.36	.13					.70				3.84
Brodhead	do			.55				.06			T.						.15	.57			T.	.30	.31	.20					.20	.45			2.79
Burnett	do		.17						.09								T.	.53	.03		.14	.24	.09	.22	.03	T.			.07	.34			1.95
Delavan	do			.57				.15		.01							T.	.38	.04			1.37	.14	.60					.81				4.07
Dodgeville	do																																
Downing	Chippewa																.01	1.92				.45	.20	T.	.01	.10							2.69
Eau Claire	do																.15	1.92			.12	.50	.33		T.	T.			.06				3.08
Ellsworth	Mississippi																																
Glidden	Chippewa							T.									1.40	.12	.07		.15	.45		.12	.05						.05		2.51
Grand Rapids‖	Wisconsin																.29	.60	.20		T.		.41	T.	.01					.04			1.63
Grantsburg	St. Croix															T.		.75				.18	T.					T.					0.93
Hancock	Wisconsin																.10	.52			.22	.10	.02	.08					.02	.15			1.21
Hatfield	Black																.27	1.17				.43	.27						.06				2.20
Hayward	St. Croix								T.								*	2.45	T.		T.		.25	.20					.30				3.20
Hillsboro	Wisconsin		T.														.85	.25				.40	T.						.05				1.55
Koepenick	do																	1.13	T.	.19	T.		.40	.10	T.				T.	.12	T.		1.94
LaCrosse	Mississippi		T.													.02	.59	.44				.55	.01	T.					.02				1.63
Lake Mills	Rock		.56	.02				T.	.11		T.						T.	.74			.03	.64	.47	.26		T.			.06	.16	T.		3.05
Lancaster	Mississippi		.74								.09					.10	.55	1.00		.18		.59	.04	.10					.13	.34			3.86
Long Lake	Wisconsin									.05							.12	1.60	.03	.06	.07	.09	.17	.08	.15				.04	.03	.01		2.50
Madison	Rock		.64					T.	.11		T.					.04	.04	.45		.01	.44	.30	.32	.09		T.			.38				2.82
Mather‖	Wisconsin																01.	.74	.23				.44	.02	.10					.02	T.		1.65
Mauston	do																.22	.75					.20							.18			1.35
Meadow Valley	do																.30	.73				.21		T.	.25				T.				1.49
Medford	Black																*	2.30			.65	.30	.40		.15				.05				3.85
Merrill	Wisconsin																.20	1.20			.13			.04	.48				.02				2.07
Minocqua	do																.20	2.30	.10		.15	.25	.30	.07	.05				T.	.07			3.49
Mondovi	Mississippi																.15	1.64	.01			.78	.19	.11		.02			.10				3.00
Mount Horeb	Rock	.02	.95					T.	.02								.29	.64	T.		.33	.16	.64	.36					.02	.24			3.67
Muscoda‖	Wisconsin			.12													.08	.96	.12		.16		.28	T.						.58			2.30
Neillsville	Black																40	.50	.23				.76										1.89
New Richmond	St. Croix																.35	.60			T.	.80		T.	T.								1.75
Osceola	do															T.	.90	.40		.03		.23		.03					.05				1.64
Portage	Wisconsin		T													.10	*	1.29			.50	.27	.02						*	.60			2.78
Prairie du Chien‖	Mississippi			.14					T.			.08					.08	.82	.06		.12		1.34		T.		.06		.36				3.06
Prentice	Chippewa								T.								1.10	.62	T.		.11	.52	T.	.12	.17				.13	T.	T.		3.77
Rhinelander	Wisconsin																.11	1.65	.08		.04	.11	.14	.06	.12				.04	.09	.02		2.46
Sauk City	do																																
Shullsburg	Mississippi		.76					.09				.14					.31	.54			.45	.47	.25	.04		.33			.12	.20			3.70
Soton Springs	St. Croix															T.	.80	.60		.10		.20							.30				2.00
Spooner	do																*	2.00	T.		T.	.25		.04	.06				.09	T.			2.44
Stanley	Chippewa									T.							.24	2.22			.15	.32	.34	.03	.01	.04			.03				3.38
Stevens Point	Wisconsin																T.	.67				*	.70	T.									1.37
Valley Junction	do																.31	.89				.39	.28	.11	.08				T.	.08			2.14
Viroqua	Mississippi		T.								T.						.27	1.05				.34	.15		T.	T.			.02				1.83
Vudesare	Wisconsin								T.			T					.05	1.00	.30	.03	T.	.10	.44	.04					T.	.10	.04		2.10
Watertown‖	Rock		.05	.48					.20								T.	.08	.50		.10	.14	.50	.40	.07					.32	.03		2.87
Waukesha	Fox		.35						.18									.32			.32	.83		.73		.12			.40				3.25
Wausau	Wisconsin																	.89					.23		.07	.03			.22	.10			1.54
Weyerhaeuser	Chippewa								T.								.06	1.94	.07		.07	.20	.28	.04	.04				.07	.04			2.81
Whitehall	Mississippi																																
Iowa.																																	
Albia‖	Des Moines	.30	.55	.25			.10	.35	.51			.11					.23	.11			.07	.91	.05						.05	.40			3.99
Algona	do						T.				.14	.70				.02	.30	.15			T.	.62							.07				3.00
Alta‖	Raccoon	T.	.06	T.			.46	.35				.31				T.	.10	.77				.75	.15						T.	.02			2.97
Amana	Iowa		.48					.33			T.						.20	.18	.83		.03	.07	.85						.04	.16			3.17
Ames	Skunk		.23				.10	T.			T.	T.					.11	.50	.25		T.		.40						.20				1.79
Baxter	do		.37	.01			T.	.02	.01		T.	.05					.10	.76	.67		.07	.10	.60	.05					.15	.40		.02	3.38
Belle Plaine	Iowa		.60								.02						.22	.45	.48		.10		.85	T.					.30				3.02
Belmond	do		.07				T.				.03	.14					.03	.42	.29			2.40	T.	T.					.08			.06	3.52
Bloomfield	Mississippi	1.46	.06				1.00	.04									*	.57				*	*	.40					.56				4.09
Bonaparte	Des Moines	1.75						.60				.22					.10		.21		.10	.06		.05	.05				.95	.43			4.52
Boone‖	do		.02	.30			.06	.07				.06						.25	.47	T.		.03	.38	.02					.03	.13			1.82
Britt	Iowa						T.				.07	.19					.06	.33	.39				1.05						.04				2.13
Buckingham	Cedar																																
Burlington‖	Mississippi	.43	1.48	.13				.20	.58	T.		.28					.43	.10			.10		.03	.30	.02				.02	.63			4.73
Carroll‖	Raccoon		.55				.65										.24	.25		.23	.64	.13							.17				2.86
Cedar Rapids‖	Cedar	T.	.38					.10			T.	T.					.15	1.05	T.		.09	T.	.45		T.		T.		.20				2.51
Charles City	do		.08								.38	.03					.10	.95	.42				.65						.05			.01	2.67
Clear Lake	do										T.	.33						.44	.85			1.60							T.				3.22
Clinton	Mississippi		.85					.13			.15						.15		.16	.13	.01	.20		.10					*	1.31			3.19
Columbus Junction	Iowa	.05	1.65					.30	.05		T.	.30					.20		.25	.03		.40	T.						.90	1.13			5.26
Davenport	Mississippi	.47	.67					.07	.02		T.	.14					.14	.01	.16	.06	.01	.66	.01	.07		T.			.92	.01			3.42
Decorah	do										T.						.15	.78	.34			2.10							.45				3.82
Delaware	do		.77					.05				.21						.97	.76		.24	.60	1.30			T.			.17	.33			5.30
Des Moines	Des Moines	T.	.31			.11	.17	T.			.02	.05					.18	1.41	.03		.03	.12	.49					T.	.34			T.	3.26
De Soto	Raccoon		.21			T.	.48	.03			T.						.18	.54	.16		T.	.21	.61						.50	.04			2.96
Dubuque	Mississippi		.69					.04			.15	.02					.07	.25	.46		.07	.47	.92		.01		.01		.26				3.42
Earlham	Raccoon		.45				.04	.64	.24		T.	T.	T.				.16	.91			.16		.55						.66	.12		T.	3.93
Elkader	Mississippi		.12									.34					.10	.60	.48			.16	1.75	T.			.04		.34				3.93
Elma	Wapsipinicon		.05									.07	.40				.08	.83	.76				1.00	.03	T.	T.	T.		.11			T.	3.33
Estherville‖	Des Moines	T.						.06			T.	.15					.01	.03	.50			.04	.20	.51						.02			1.52
Fairfield	Skunk	.13	1.12	.01				.58	.04			.18					.22	.01	.10		.08	.02	.21						.37	.68			3.75
Fayette	Mississippi		.12					T.			.40						.07	.70	.38				.77		T.				.37				2.81
Forest City‖	Cedar						T.				.30						.05		.76	.03			.35	.65					T.				2.14
Fort Dodge‖	Des Moines		.20	.21			.09	.12				.08						.04	.46		T.	1.03	.18							T.	.07			2.49
Fort Madison	Mississippi	T.	1.32					1.37		T.	.43	T.					.10		.10	T.	.60		.10	T.					1.20	1.10		T.	6.32
Gilman	Iowa	T.	.48					T.									1.62	.42				.98	.24	T.					.21	.18			4.13
Grand Meadow	Mississippi		.12					T.				.32					.62	.40			.02	2.12	.03			.05			.23	.03			3.94
Greene	Cedar		.14								.12	.14					.16	.60	.78				.89						.10			.16	3.09
Grinnell	Iowa		.55				T.	.11			T.	.08					.22	.92	.97		.04	.11	.50						.15	.24			3.89
Grundy Center	Cedar		.25					T.									.20	.70	.50	.80									.23	.15			2.83
Guthrie Center	Raccoon		.48			.09	.78	.03		T.	.03	.09					.19	.40	.09			.10	.56					T.	.45	.06	.02	T.	3.37
Hampton	Cedar		.04	.22							.18						.08	.64					.75						.06			T.	1.97
Humboldt	Des Moines		.09				.08					.10					.04	.28	.30				1.65						.10	T.			2.64
Independence	Wapsipinicon		.80														.03	.90			.06	.70				.07			.07				2.63

TABLE 2.—*Daily precipitation for May, 1910. District No. 5*—Continued.

Stations.	River basins.	Day of month. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total.
Iowa—Cont'd.																																	
Indianola	Des Moines		.57			.01	.30	.13	T.	T.	T.	.14				.24	.15	.72		.10	.04	.65	.20	T.					T.	.32			3.57
Iowa City‖	Iowa	.18	.20	.15					.28		.02	.16					.17	.42			.19	.45	.24						.38	.73			3.57
Iowa Falls‖	do		T.	.24				T.	T.		T.	T.					.12	.87	T.			.58							T.	T.			1.81
Jefferson	Raccoon																																
Keokuk	Mississippi	1.46	1.60				T.	.70			.17	.92				.13	.04	.10		.04	.11	.11	.11	.15				1.21	.02			6.87
Keosauqua‖	Des Moines	.06	1.67	.15			.03	.24	.26			.60					.11	.14			.28	.15	.04	.06	T.				.50	.52			4.81
Knoxville	do		.70				.13	.37				.20				.22	.10	.21		T.	.12	.46	.13						.13	.29			3.06
Lacona	do	.01	.54				.48	1.00								.20	.28			.12		.25	.10						.24	.44		.02	3.68
Le Claire‖	Mississippi	.77	.89	.20				.01	.21	T.		.13					.14	.18	T.		.07	T.	.20	.06	.01		.02		.33	.89			4.11
Marshalltown‖	Iowa		.33	.30				T.	T.		.02	T.					.16	1.07			.14	.76	.11						.13	.29			3.31
Mason City	Cedar		T.								.32					.07	.03	1.10				.75							.05				2.32
Mount Pleasant	Skunk	.05	1.76					.39	T.			.11				.11	T.	.19		T.	.06		.15	.05					.68	.70		T.	4.25
Muscatine‖	Mississippi	.65	1.25	.15				.08	.09		T.	.30					.12	.20			.08		.08	.07					.35	.97			4.39
New Hampton	Wapsipinicon															.41	.58	.85				.69							.38				2.91
Newton	Skunk																																
Northwood	Cedar						T.					.42				.02	.40	.74				1.03										.05	2.66
Olin	Wapsipinicon		.62					.10				.04				T.	.14	.78			.09	1.15	T.	T.		T.			.26	.18			3.36
Osage	Cedar										.43					.50	.50	.95				1.11							T.			T.	3.49
Oskaloosa	Des Moines		.68			T.	.07	.68			.10					.15	.41			.10	T.	.81					.03	.52			T.	3.55
Ottumwa	do	.01	.56				.04	.53	T.			.20				.12	.14	T.		.03		.35						.17	.42			2.57
Pella	do		.56				.06	.27			.05	.13				.12	.08	.42		.04	.07	.74	.06					.10	.24		T.	2.94
Perry	Raccoon		.54	T.		T.	.50				T.					T.	.35	.44			.40	.55					T.	.24			T.	3.02
Plover	Des Moines		T.				.26					.20				T.	.21	.07				.55											1.29
Pocahontas	do		T.			.35					.03	.09				.01	.35	.12				.90							.12				1.97
Ridgeway	Mississippi	.04	.05								.13					.12	1.00	.57			.02	2.10	.01	T.		T.			.08				4.12
Rockwell City	Raccoon		.60				.80									.15	.35			.10	T.	1.40							.50			T.	3.90
Sac City	do		.35			.12	.46									.10	.25					1.11											2.39
St. Charles	Des Moines		.62			.02	.51	.21			.02	.02				.21	.15	.80			.01	.33	.55								T.		3.45
Sigourney	Skunk		.71					.60				.17				.23		.11		.04		.60							.12	.40			2.98
Stockport	do	.02	1.55				T.	.62	.04	T.		.15				.12	T.	.16		.04	.12	T.	.11	.02					.48	.60			4.03
Storm Lake	Raccoon		T.				.80				T.	.29				.08	.44		.01			1.03							.12			T.	2.77
Stuart‖	do																																
Tipton	Cedar		.58					.31								.10	.29			.03	.11	1.92							.71	.30			4.35
Toledo	Iowa		.50						.02		T.					.25	.80	.60			.15	.82	.20						.10	.15			3.59
Wapello	do	.13	1.13					.28									.16			T.	T.	T.	.20	.08					.63	.80			3.41
Washington	Skunk	.02	1.01					.34				.12				.16		.26		.05		.57							.33	.71			3.57
Waterloo‖	Cedar		.19								.10					.11		.81			.03	.45	.24	T.				.02	.06		.04	2.05
Waukee	Raccoon	T.	.25	T.		.04	.54	.03			.02	T.				.17	.57	.13		T.	.01	.38	.01						.68	.24		.01	3.08
Waverly	Cedar		.18						.03		T.					.08	.46	.40			.02	.63							.17				1.97
Webster City	Des Moines		.46				T.				T.	.07				T.	.17	.43				.57		T.					.13			T.	1.83
West Bend	Des Moines	T.	T.				.20					.27					.29	.14				.58							.11				1.59
Whitten	Iowa		T.					T.	T.			T.				.36	.52	.35				.76							1.00			T.	2.19
Winterset	Des Moines		.65			T.	.63	.25		T.	.03	.03				.23	.63	.33		T.	.02	.75	.13						.05	.95	T.	T.	4.68
Zearing	Iowa																																
Missouri.																																	
Darksville	Chariton																																
Gorin	Mississippi	.07	1.47				.07	.81				1.15				.12		.13		.14		.35	.04						1.84				6.19
Hannibal	do	.39	.54			.02	.35	1.55	.01		.23	.62				.15	.01	.27		.30		.76	.24				T.	.07	1.07			6.58
Louisiana	do	.27	.55	.10			.12	1.55	.05			1.00				.08	.03	.78		.21		.43	.80				T.		1.37			7.34
Mexico‖	do	.02	.25	.67			.35	2.10	.91			.37	T.				.17	.40			.34		.16	1.43				.09	.08	1.12		.02	8.48
Steffenville	do	.50	1.70			T.	.10	1.85	.10			2.32					T.	.21		.05		.55	.30			T.	.27	.63	T.				8.58
Sublett	do		1.50				T.	1.50				2.00				.10		1.00		1.00		1.50	.50					.50	.25	T.			9.85
Warrenton‖	do		.64	1.38	T.		.26	1.63	.18	.02		.11	.13				.08	.67			.09		.07	.97	.02		.07			.26				6.58
Indiana.																																	
Collegeville	Iroquois	T.	.60					.15	.05			.37						.38			.45	.50	.40	.80						2.70			6.40
Knox	Kankakee	.41	.45					.06	.04			.45					T.	.40	.04		1.00	.03	.32	.87						.99	T.	.01	5.07
Laporte	do	.68	1.38	.04				.10	.56	.02	T.	.25						.20	.06		.46	.10	.09	1.34						.89		.05	6.31
Plymouth	do	.20	.57	T.				.03	.02	T.		.50						.28			1.10	T.	.34	.57						.83	T.	.10	4.54
Illinois.																																	
Aledo	Mississippi	.26	1.58					.17			T.	.23				.09	.12	.19		.02	.10	.52		.17		T.			.40	.52			4.37
Alexander	*Illinois*	.03	.32	.11				.90	.14			1.06				.02	.10	.24		T.	.24	T.	*	1.19						.90			5.25
Antioch	do								.30												26	1.05	1.65					1.68					4.94
Astoria	Illinois	.40	.56					1.27	.20	T.		1.25				.15	.10	.50		T.	.35	T.	T.	.60					T.	.95		T.	6.33
Aurora	do	.96	1.28					.10	.12			.46						.27			.02	.76		.75		.68	.04		T.	.76			6.20
Bement	Mississippi	.33	.64	.64				.88	.15			.85									.49	.87	T.	1.45						.85			7.15
Benton	do			.65			.30	.90			T.	.20	.45					.12				T.		1.45	.10								4.17
Bloomington	Illinois	.22	.33					.71	.08			.27						.36				.09		1.31		.02				1.92			5.31
Cairo	Mississippi		T.	.01			.02	.22			.07	.07				.02		.07		.05	.04	.04	.47	.01	1.69					.08	T.		2.86
Carbondale	Mississippi			.13			.35	.30	.01		.05	.31	.17				.07							1.13	.29		T.				T.		2.81
Carlinville	Illinois	.30	1.00	.67			T.	.64	.15			.75				.02	.12	.46			.07	.04	.03	1.32						.95			6.52
Carlyle	Mississippi	.20	.50	.15				.80				.60					.15				.40			2.20						.40			5.40
Chester	do																																
Clinton	Illinois	.18	.78	.08				.67	.10			.76						.18			.31	.28	.02	1.40		T.				.74			5.50
Coatsburg	Mississippi	.77	1.03					1.44	.18			1.27				.15				.05	.40		.08	.70	T.				T.	.55			6.62
Cobden	do			.35			.40	.47	T.		.05	.04	.12			T.	.05	.10		T.	.28			1.25	.55						T.		3.66
Dakota	Mississippi	T.						.02				.10					.13	.37			.02	.53	.35	.09		.09			.24	.38			2.32
Decatur‖	Illinois	.12	.82	.72				.85				.95					.02	.33			.30	.39	.48	1.53						.65			7.16
Dixon‖	Mississippi	.81	.88	.24					.10	T.		.15					.17	.47	T.		T.		.55	.35	.10		T.		T.	.40			4.22
Du Quoin	do	T.	.54				.40	.32	T.		.04	.69				.08		.03		.08			.73			.08	T.		T.				2.99
Dwight	Illinois	.12	1.30					.09	.16			.36						.30			.03	T.	.85	.97	.02	.07				.84			5.11
Edwardsville	Mississippi		.93	.56			.08		.62		.02	.66					.10	.20		.06	.03		.12	1.97				.01		.20			5.56
Galva‖	Illinois	.32	2.03	.01				.25	.38	T.		.36				.11	.17	.48			.07	.15	.03	.43		.03			.27	.46			5.55
Grafton‖	Mississippi		.48	.74			.06	.78	.24	.08		.56	.02				.12	.40		.08				1.46						.24			5.26
Greenville	do	.05	.30				.28	.68	T.			.45				.05	.09	.07						3.41	1.45									3.76
Griggsville	Illinois	.35	.40				T.	1.56	.28			.95				.14	T.	.61		T.	.15	T.	.44	.66						1.32			6.86
Halfway	Mississippi	T.		.21			.21	.26	.02		.05	1.00					.05	.11		T.	.20	T.		1.85	.48			.06					4.50
Havana	Illinois	.57	.61					.87	.20			.89				.16		.55			.23	T.		.82					2.44				7.34
Henry	do	.34	2.00					.21	.31			.32					.11	.58			.06	.07	T.	.74	.03	T.			T.	1.43			6.00
Hillsboro‖	Mississippi			.72				.80	.35	T.		.42	.30				.10	.12			.10	T.		2.05	.05					1.02			6.03
Joliet	Illinois	T.	1.27					.03			T.	.39						.30			.01	.07	1.28	.47		.21			.45	.42			4.90
Kishwaukee	Mississippi		.62					.04	.02		*	.12					.11	.46			.03	1.06	.41	.19	.08	.06			.35	.70			4.25
La Grange	Illinois	.32	1.35					.53	.10		T.	.21						.23				.45	.23	.08		.05				.78			5.13
La Harpe	do	T.	3.20					.94	.19			.27				T.	.16	.11		.05	.37		.41	.22					.22	.74		T.	6.88
Lanark	Mississippi		.57					T.	T.		T.	.40				T.	.17	.26		T.		.81	.18	.08		T.			.50	.34			3.31
La Salle	Illinois	.56	1.07					.17	.11		.06	.14				.03		.59		.02	T.	1.54	.06	.54		.01			.87	.25			6.02
Lincoln	do	.42	.23					.72				.84					.04	.33			.58	1.01	T.	1.00		T.			T.	.80			5.97
Loami	do	T.	.20	.40				.90	.10			1.50				T.	.35	.53		T.	.25	T.	T.	.92					T.	.40		T.	5.55
Martinton‖	do	.20	.05					.16	T.		.40						.01	.10		.38	.15	.30	1.30	.15				1.27					4.47
Mascoutah	Mississippi		.06	.54				.77				.51					.09	.30					.39	2.56									5.22
Minonk	Illinois	.52	1.53					.25	.20			.25						.51			.03	T.	.06	.77		.06			T.	.34			4.52
Monmouth	Mississippi	.26	1.99					.51	.15			.14				.08	.20	.11			.14	.08	.10	.33					.26	.31			4.66
Morrison	do	.10	.68	.01				T.	.15		T.	.13				T.	.16	.38			.16	.15	.03	.12		T.			.57	.51			3.15
Morrisonville	Illinois	.36	.92	.69				.80	.04			1.49				T.		.22			.09	.32	1.46	1.36						.90			8.65
Mt. Vernon‖	Mississippi	.54						.38	.05			.16	.20				.02	.03	T.		.03			1.15	.01					.05			2.61

TABLE 2.—*Daily precipitation for May, 1910. District No. 5*—Continued.

Stations.	River basins.	Day of month.																													Total.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Illinois—Cont'd.																																	
Oregon	Mississippi		.85									.35						.40				.65	.85	.25		.10			.20	1.00			4.65
Ottawa	Illinois	.35	1.70					.12	.15			.15						.47	T.			.65		.72	.06	.15			.76				5.28
Pana	Mississippi	.04	.52	.57				.78	.01			1.28	T.				.02	.24			.25	.45	.01	1.24						.65			6.06
Peoria	Illinois	.30	.91					.67	.01		.03	.12				.13		.80		.06	.03	.13	.39	.54		T.			.14	.23			4.49
Pontiac	....do	1.42	.79					.17	.31			.27						.30			.04			1.10		T.	.08			.56			5.04
Riley	Mississippi		.75					.03	.08			.05						.40			.04	.66	.54	.46	.02	.04			.10	1.25			4.42
Rockford‖	....do		.17	.41					.03	.01		.06					.06	.28	.27		.01		1.95	.41	.09	.05				.96			4.76
Rushville	Illinois	.40	.72					.92	T.	.04	T.	1.15				.32		.52		.46			.64	T.					.91	T.		.03	6.11
St. Charles	....do	.63	1.45					.02	.33			.17						.41			.03	1.22	.42	.64	.07	.18	.20		T.	.66			6.43
St. Peter	Mississippi	T.	.05	.35			T.	.90	T.			.70					T.	.20			.11	T.	1.05							.50			3.36
Springfield	Illinois	.09	.39				.13	.73	.03		T.	.92				.06		.19		.04	.18	.01	.52	.35					T.	.74		.01	4.39
Streator‖	Illinois	.28	1.91	.09				T.	.15	T.		.37	T.				T.	.26	.16		.03	.04		.76	.10					1.00			5.13
Sullivan	Mississippi	.06	.93	.32				1.17	.14			.85						.08			.55	.65		1.43						.57			6.75
Sycamore‖	....do	.70	.73	.40				.20				.20						.20	.25		.07		.61	.50	.25		.15		.55				4.81
Tilden	....do	.23		1.43	.43	.01						.43	.04			T.	.12	.30			.41		.04	1.81			.03	.18			T.		5.46
Tiskilwa	Illinois	.53	1.71					.05	.53			.25				T.	.25	.81			.05	1.23	T.	.62	.14	.13			.10	.70			7.10
Walnut	Mississippi	*	2.06					.04	.20			.31				*	.24	.48		T.	.05	.19	.20	.37		.09			.02	.59			4.84
Warsaw‖	....do	2.99	.13					1.15				1.47				.24	.02			.26		.30	.15						.41	.69			7.81
White Hall	Illinois	.05	1.16	.47			.01	1.57	.06			.80				.05	.15	.35			.04	T.	.01	1.06						1.40			7.18
Windsor	Mississippi	.02	.78	.49				1.15	.05			.85						.06			.40			1.94						.58			6.32
Winnebago	....do		.66					.03	.03			.08					.09	.52				1.40	.33	.25		.20			.43	.71			4.73
Yorkville	Illinois	.50	.50					.05	.20			.50						.20				1.00	.25	.75		.04				.50			4.49
Zion	Mississippi	.05						.03			T.					T.		.30		T.	.02	1.98	.86	T.		T.			.60				3.84

TABLE 3.—*Maximum and minimum temperatures at selected stations, May, 1910. District No. 5, Upper Mississippi Valley.*

North Dakota.

Date.	Bottineau.§§		Devils Lake.		Lisbon.§§		Minot.§§		Pembina.§§		Collegeville.		Crookston.§§		Grand Meadow.		Montevideo.§§		Moorhead.		New Ulm.§§		Pine River Dam.		St. Paul.		Winnibigoshish.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1...	49	26	47	30	49	34	51	32	42	22	62	45	45	32	71	37	65	39	54	32	74	39	56	40	67	42	59	40
2...	58	27	55	26	56	20	62	28	50	24	51	32	50	28	55	36	56	35	52	25	54	37	52	27	53	37	50	26
3...	65	32	62	35	63	25	65	34	72	32	59	33	63	37	60	23	62	27	64	28	64	29	58	24	58	32	58	25
4...	65	33	65	39	66	26	68	39	78	41	63	35	66	34	65	25	66	35	66	32	69	34	64	27	65	40	46	35
5...	54	40	56	42	60	40	53	49	63	42	63	40	65	40	65	30	69	40	61	42	67	38	65	28	68	40	62	32
6...	59	31	61	34	59	43	56	42	62	39	65	48	66	40	58	44	59	45	66	43	59	47	68	35	65	52	70	38
7...	70	30	35	36	63	25	71	40	62	38	70	44	68	37	67	41	71	44	68	34	72	45	69	38	72	48	69	44
8...	69	39	67	43	70	37	79	48	60	40	71	47	68	45	75	36	82	38	70	38	76	37	69	34	73	45	66	42
9...	62	28	65	32	70	38	70	34	58	38	69	47	67	36	70	36	73	42	68	38	71	39	68	35	69	51	62	43
10...	58	35	57	30	63	40	62	35	41	28	63	47	54	39	70	49	73	52	58	36	72	49	59	35	69	46	57	43
11...	54	26	51	23	56	32	57	35	40	22	57	32	50	28	60	34	65	33	54	27	66	37	58	32	58	36	53	31
12...	59	20	56	21	59	25	77	28	52	20	57	33	53	25	61	29	63	35	56	24	62	33	53	34	60	35	54	34
13...	73	31	69	30	68	20	77	33	71	28	64	35	63	28	64	30	68	29	66	27	68	33	63	31	64	37	62	31
14...	76	38	80	52	81	40	79	50	79	39	73	43	58	35	70	34	80	39	81	40	79	37	75	34	74	40	71	36
15...	54	48	56	47	57	48	54	48	62	52	68	50	69	48	68	43	56	45	64	46	69	49	70	46	68	51	69	46
16...	51	37	50	34	59	39	51	37	52	49	55	47	60	48	65	42	67	50	55	45	58	50	53	46	55	48	54	47
17...	72	26	71	31	70	37	73	31	68	29	59	47	68	38	52	41	65	43	68	38	60	47	60	46	61	48	58	45
18...	53	36	52	36	89	37	58	41	41	34	79	48	57	38	57	47	84	43	77	43	81	43	65	48	79	46	60	48
19...	52	35	60	35	72	47	64	35	48	33	79	50	62	43	75	42	85	55	75	44	82	53	80	46	77	54	63	44
20...	55	29	51	33	54	37	57	29	52	32	59	50	50	38	74	49	54	45	52	36	65	56	58	39	67	50	56	44
21...	67	31	61	36	65	29	68	38	71	30	54	39	60	32	72	53	55	40	64	31	51	46	57	35	50	45	61	35
22...	60	35	70	43	76	32	69	41	58	51	68	38	73	40	56	46	70	40	74	38	61	42	68	32	63	42	70	35
23...	62	37	60	40	64	41	67	41	51	40	70	47	56	43	55	42	71	46	60	43	70	42	63	48	68	45	65	48
24...	63	35	56	36	58	36	65	36	52	36	56	43	55	41	67	40	61	43	56	40	60	44	57	47	57	46	56	42
25...	65	32	62	31	65	33	69	30	74	30	65	43	64	33	60	38	66	38	64	34	65	41	65	31	64	42	66	34
26...	76	41	75	40	74	29	75	38	78	46	69	44	72	42	70	41	75	38	74	38	75	36	72	33	73	42	70	34
27...	84	47	81	54	76	48	84	53	78	50	72	49	79	52	72	52	78	50	78	49	78	43	75	52	74	48	72	47
28...	58	52	62	36	75	56	57	53	60	52	73	55	72	58	65	49	78	56	76	51	75	53	68	43	67	55	70	55
29...	58	32	59	38	69	42	63	38	51	33	72	40	53	34	64	45	70	47	65	40	72	43	59	36	63	46	66	36
30...	72	38	70	34	72	35	76	38	79	28	68	37	66	32	67	40	74	37	70	35	73	40	65	44	69	44	65	37
31...	69	40	69	41	73	45	74	51	62	40	69	47	67	40	70	36	74	43	72	45	74	43	68	48	71	45	68	44
Mns	62.8	34.4	62.0	36.1	65.9	35.9	65.9	38.8	69.2	36.0	65.2	43.1	61.9	38.2	65.2	39.4	68.9	41.5	65.4	37.5	68.5	42.1	63.9	37.9	65.8	44.5	62.8	39.4

Wisconsin. Iowa.

Date.	Delavan.		Eau Claire.		La Crosse.		Madison.		Mauston.		Spooner.		Wausaw.		Algona.		Cedar Rapids.§§		Charles City.		Davenport.		Des Moines.		Dubuque.		Keokuk.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1...	65	39	70	37	69	39	64	42	68	34	68	40	64	34	71	38	72	42	70	38	66	45	70	43	68	42	69	48
2...	54	36	61	37	58	40	53	33	64	40	50	31	64	39	61	39	54	46	55	35	57	40	61	42	58	37	65	44
2...	54	31	60	26	58	32	50	33	57	28	56	22	54	26	60	24	56	37	59	28	56	40	56	37	55	36	56	42
4...	54	28	65	30	60	31	54	36	60	28	61	35	57	26	64	32	60	35	62	28	58	38	59	38	58	36	58	38
5...	57	25	68	30	65	34	59	37	64	29	68	35	63	31	62	38	62	35	61	32	59	38	58	42	60	36	61	37
6...	60	31	67	34	62	45	58	41	60	35	68	43	65	40	54	45	61	38	57	46	61	42	54	44	60	43	59	46
7...	54	35	70	42	65	46	55	43	61	32	71	41	66	36	65	43	54	45	61	47	52	45	54	44	57	45	55	44
8...	60	44	76	35	75	44	67	45	70	40	73	42	72	36	74	38	73	46	74	43	67	47	72	45	71	50	68	44
9...	72	46	71	49	70	49	67	52	68	50	65	44	71	48	75	48	77	49	71	48	75	51	76	52	72	51	75	51
10...	70	46	70	41	73	44	69	50	70	40	63	43	67	40	76	49	79	51	70	48	76	51	78	46	71	52	78	50
11...	61	39	60	35	60	41	59	40	60	36	56	30	64	32	59	40	62	50	59	41	59	46	62	48	61	47	71	51
12...	60	32	62	34	61	39	56	40	60	29	57	30	56	31	60	34	61	41	60	37	60	40	61	41	59	40	59	44
13...	58	31	65	31	63	37	58	37	67	36	58	29	56	30	65	32	63	38	62	34	60	39	65	36	61	39	63	40
14...	63	25	73	32	71	36	63	34	60	28	70	35	60	38	76	36	70	36	71	33	66	39	71	39	66	39	67	45
15...	67	41	71	47	69	49	64	42	67	45	70	51	67	42	66	46	64	39	66	47	63	48	54	48	65	48	61	50
16...	67	41	63	47	57	49	62	48	62	45	57	48	66	46	55	48	65	49	58	44	67	50	61	49	63	48	67	50
17...	60	52	58	48	59	48	59	50	70	45	53	43	65	52	60	44	60	50	58	45	63	51	62	46	60	50	66	52
18...	76	53	77	42	78	45	75	47	74	45	67	45	70	40	79	44	79	45	78	42	76	46	76	44	75	45	75	47
19...	81	52	78	52	75	56	74	52	75	54	78	46	76	50	78	51	76	47	73	50	75	55	73	53	75	53	75	53
20...	76	56	75	56	72	57	73	56	75	56	65	52	75	54	68	55	79	57	74	54	79	60	78	56	76	58	80	58
21...	67	51	63	46	65	51	64	56	72	54	53	38	74	46	60	45	77	59	62	49	76	60	73	52	71	58	82	65
22...	70	52	61	45	59	51	58	52	60	48	60	39	67	44	56	43	62	54	57	46	67	59	60	49	64	58	78	59
23...	63	47	70	43	72	52	68	49	68	50	68	37	65	49	70	40	72	54	69	46	71	56	71	46	69	54	74	55
24...	67	45	58	45	59	46	62	47	65	44	56	43	62	45	67	42	67	48	63	42	67	49	67	46	64	47	70	51
25...	52	39	64	43	63	45	58	45	62	42	62	36	58	36	64	39	66	45	62	43	63	47	66	43	61	48	68	46
26...	62	38	72	37	70	39	63	44	68	34	71	37	67	33	70	36	71	42	69	36	69	46	68	43	68	43	69	46
27...	72	35	76	38	76	40	70	46	75	38	73	43	75	35	76	45	76	45	73	41	72	48	71	53	71	44	71	48
28...	74	43	75	47	68	55	70	47	70	45	61	52	73	46	76	55	81	52	73	52	76	54	78	55	74	52	79	54
29...	65	54	64	47	61	46	62	46	67	52	60	42	61	44	71	45	73	52	69	51	72	56	73	58	69	54	73	60
30...	58	41	67	40	65	45	56	44	60	42	65	36	52	39	72	45	71	49	68	42	69	49	73	55	64	47	73	54
31...	67	37	71	36	70	41	64	44	64	35	70	31	63	37	74	44	72	47	70	44	70	46	73	50	68	48	72	47
Mns	64.4	40.8	67.8	40.4	66.1	44.3	62.4	44.5	65.9	40.6	63.6	39.3	65.0	39.5	67.0	42.0	68.2	45.9	65.5	42.3	66.7	47.8	66.9	46.5	65.6	46.7	68.9	49.0

TABLE 3.—*Maximum and minimum temperatures at selected stations, May, 1910. District No. 5*—Continued.

Date.	Hannibal, Mo.		Laporte, Ind.		Illinois.															
					Cairo.		Greenville.		La Salle.		Monmouth.		Mt. Vernon.		Peoria.		Springfield.		Winnebago.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1	69	50	66	43	79	66	76	57	61	44	66	46	85	61	68	45	73	48	69	42
2	69	42	58	38	79	67	79	57	55	39	63	41	80	61	58	41	68	41	57	37
3	57	41	51	38	73	47	66	42	55	38	58	39	55	44	56	38	59	41	57	33
4	59	40	53	34	59	49	63	37	56	34	60	32	62	40	58	36	60	34	57	30
5	61	41	60	35	65	45	65	38	59	34	63	30	65	40	62	37	62	36	60	30
6	55	46	63	38	57	49	59	51	63	38	63	42	59	48	64	42	60	47	62	33
7	48	44	53	43	67	51	55	46	54	44	57	44	65	48	52	44	52	45	56	40
8	65	45	57	48	55	51	52	46	59	47	66	45	52	48	57	48	55	47	63	42
9	76	49	66	45	77	49	76	48	73	49	76	47	80	46	73	44	77	48	73	45
10	78	51	73	46	78	58	80	55	74	49	79	43	80	50	76	44	78	55	71	45
11	64	46	63	39	85	56	68	52	57	45	75	48	78	60	60	42	64	48	60	44
12	60	43	56	36	67	50	66	42	60	41	59	41	68	43	59	40	62	44	61	35
13	63	39			66	46	67	41	59	39	59	38	66	41	57	35	62	42	61	33
14	66	39			65	48	67	42	65	35	69	34	68	37	65	37	65	39	66	29
15	56	51			64	50	68	46	64	45	64	44	67	42	63	45	61	46	61	43
16	69	51	69	43	71	55	70	52	70	53	68	49	72	54	68	51	69	52	69	49
17	62	52	63	52	73	58	69	55	60	53	65	51	73	55	59	52	63	52	64	52
18	73	46	73	46	76	53	77	46	76	48	79	44	78	45	74	45	75	49	77	42
19	74	50	75	50	72	57	78	50	75	53	78	49	76	46	75	52	75	54	77	48
20	78	60	76	54	77	64	83	60	76	58	82	56	83	60	77	59	79	61	78	55
21	81	66	80	48	73	62	76	62	82	58	87	59	82	63	77	59	78	65	75	54
22	71	59	81	56	76	60	82	62	79	58	71	59	81	60	78	60	76	60	77	56
23	73	56	63	46	74	62	70	59	65	54	74	56	77	57	69	57	68	57	66	50
24	69	51	67	50	67	57	73	54	67	51	70	48	73	54	68	47	70	54	64	48
25	68	45	63	44	74	55	72	49	61	45	69	44	73	46	66	43	69	49	62	43
26	69	44	60	39	74	58	75	50	67	40	73	41	74	53	69	40	69	48	64	38
27	68	53	67	39	73	59	70	48	71	42	74	40	72	47	72	41	71	45	70	37
28	82	59	76	43	81	60	82	57	79	49	79	52	83	54	82	54	82	56	77	46
29	75	60	74	57	84	66	80	62	70	55	74	52	84	59	71	58	76	59	68	52
30	73	53	64	43	79	61	75	54	64	49	71	49	75	61	69	48	72	43	61	44
31	71	46	51	39	75	57	74	47	68	43	73	45	61	53	69	42	71	50	67	39
Mean	67.8	49.0	65.0	44.0	72.1	55.7	71.4	50.5	65.9	46.1	69.8	45.4	72.5	50.8	66.8	46.0	68.4	49.2	66.1	42.4